Department of Mental Health

Phase II – CIMOR Evaluation
(Strategic Assessment of DMH IT System Operations)

Current Market Offerings Report

Deliverable #8

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1 Executive Summary

Fox Systems, Inc. (FOX) was engaged by the Mental Health Commission and Information Technology Services Division (ITSD) to conduct a review of the current health of the Customer Information Management Outcomes and Reporting (CIMOR) Project.

Phase II of the project includes a strategic assessment of DMH Information Technology system operations including:

- A review of current market offerings for public and proprietary systems providing functionality similar to that included in CIMOR;
- A review of other State of Missouri initiatives that may relate to DMH efforts;
- A High-Level Alternatives Recommendations Report and Cost Benefit Analysis of the options available to DMH.

The High-Level Alternatives Recommendations Report and Cost Benefit Analysis (CBA) will be driven by the findings from this report and the other reports delivered as part of this project.

This report presents the findings of the review of current market offerings for CIMOR-like and other healthcare systems, licensing structures and associated costs. Prior to starting, FOX reviewed the DMH Electronic Medical Records Assessment Report developed in 2005 by Tier to identify the recommendations resulting from that study.

ITSD has completed a considerable amount of research on alternative systems. Based on this research and options provided by FOX, ITSD selected three proprietary and three public sector systems for review by FOX. The proprietary systems selected were:

- Bond Clinician
- EnCompass
- MEDITECH.

The open source systems selected were:

- BHIPS
- VistA
- WITS

1.1 Summary of Findings

All the systems analyzed are sophisticated, comprehensive electronic medical record systems. The benchmark used for this study was the fully enhanced CIMOR with all planned and newly identified business functions. Thus some of these robust, sophisticated systems may have a lower than expected rating because their attributes are not currently part of and not planned for CIMOR. For example, VistA supports multimedia, dentistry, prosthetics, etc. So even though VistA has many more capabilities than CIMOR, these capabilities were not considered since they are not or were never planned to be implemented in CIMOR.

Table 1 summarizes the results of this study. It shows that there are no clear winners among the COTS packages. Every package has its strengths and weaknesses.

A major study assumption was that DMH did not want to give up any existing CIMOR functionality. That is, at a minimum any replacement system had to be able to do what CIMOR does today. One of the significant affects of this assumption is that some packages were found to be missing many of existing CIMOR functions. Thus, costs would be incurred to add those functions.

Again, remember: the benchmark is the enhanced CIMOR. So what might otherwise be considered a premier package may not rate as high as one might expect.

Table 1. COTS Systems Summary[1]

Vendor	Functional Fit	Missing Function Count[2]	Technical Architecture	Company / Product Stability	Cost Range (including enhancements in first year)
BHIPS	◒ Medium	**30**	● High	● High	$8 to 14 million
Bond Technologies	◒ Medium	**38**	● High	● High	$13 to 21 million
EnCompass	● High	**2**	○ Low	◒ Medium	$4 to 6 million
MEDITECH	● High	**13**	○ Low	● High	$8 to 14 million
Veteran's Administration VistA	◒ Medium	**39**	○ Low	● High	$21 to 28 million
Web Infrastructure for Treatment Services WITS	◒ Medium	**27**	● High	◒ Medium	$6 to 10 million

In terms of technical architecture BHIPS is most similar to CIMOR. Both use Microsoft .NET technology. Both utilize Microsoft operating systems. Both use C# as the programming language of choice. But BHIPS has a large number of missing functions.

Bond Technologies also uses Microsoft .NET technology. It is programmed in JAVA. Bond Technologies is almost tied with VistA for having the most missing functions at 38. Bond Technologies would maintain the system for not only DMH but all its other customers. Thus, changes unique to DMH might be difficult if not impossible to accomplish. Bond Technologies would have to have some incentive to program uniquely for DMH.

EnCompass is a web-based architecture but it is on a Linux platform. It also uses a DB2 database engine. These are consistent with present ITSD standards but not with DMH IT standards. EnCompass is also hosted. However, this could be subject to change during contract negations. Of special mention is the fact that EnCompass is missing only four CIMOR business functions. This is the closest functional fit of all the COTS packages. EnCompass most likely would not be uniquely customized for DMH.

MEDITECH uses client/server platform architecture. This could be considered a step backward by some. Most likely more applications will become web based as opposed to staying or being developed as client/server systems. MEDITECH uses its own proprietary programming

[1] See Table 3. Rating Symbols on page 11 for a description of the symbols used here.
[2] This includes functionality currently in CIMOR and functionality planned for CIMOR including data marts.

language to develop its systems. The same situation that exists with Bond Technologies regarding DMH unique applications also exists for MEDITECH. MEDITECH would maintain the system for not only DMH but all its other customers. Thus, changes unique to DMH might be difficult if not impossible to accomplish. MEDITECH like Bond Technologies would have to have some incentive to program uniquely for DMH.

VistA is enormous in every sense of the word. It costs more to implement and costs more to operate than any of the other packages. It also has more missing functions than any other package. It is written in M and ninety-five percent (95%) of all VistA systems in the VA run on Alpha/VMS/Cache. None of this is consistent with state ITSD standards.

WITS, like EnCompass, is consistent with CIMOR in its technical architecture. WITS is web based and written in C# for the Microsoft .NET architecture. It runs on Microsoft Windows operating systems. Most systems are hosted, but that is not required. WITS has 27 missing CIMOR functions that would have to be developed. WITS most likely would not be uniquely developed for DMH.

The most feasible COTS packages for DMH consideration are the following:

- BHIPS
- Bond Technologies Clinician
- EnCompass
- WITS

These four packages are candidates because they are consistent with ITSD standards and the use of web based systems.

Individual components of these four packages could also be considered as solutions to particular problems. Hooks may be present to allow integration with CIMOR. Insufficient detail is available at this time to determine whether that is possible. But .NET platforms stand a better chance of integration than other proprietary solutions.

The least feasible package is VistA. It uses architecture alien to ITSD. It is the most expensive package to implement and operate. It has the most missing functions.

MEDITECH is a powerful option that should not be overlooked. Its architecture is not consistent with ITSD. But one must first consider how important the business case is compared to the technology case. In general, business wins every time. But there are exceptions and this could be one.

Cost figures within this report are approximate and could vary significantly based on the specific system and business requirements that may be determined to be necessary. The high level nature of this report limits the specificity of cost estimates provided. This report is not intended to serve as the complete basis for decision-making. Instead, it will be used in the analysis for the High Level Alternatives Report and the Cost/Benefit Analysis. While FOX has gone to a level of specificity to develop the CBA Report a detailed gap analysis would be necessary to determine a more refined cost estimate for budget and procurement planning purposes.

2 CIMOR High Level Requirements

2.1 CIMOR Description

The Customer Information Management, Outcomes, and Reporting (CIMOR) system is the Missouri Department of Mental Health's (DMH) information management system. CIMOR was custom built for the Department and consists of a wide-range of capabilities used to collect and process mental health services for payment and reporting.

CIMOR is a "one stop and shop" system supporting organizational and administrative functions providing information tracking and consumer demographics. It also assists with inpatient facility management by offering bed tracking availability and bill calculation support. CIMOR provides significant support for billing based on delivery of services or "encounters," as they are referred to in CIMOR. Typically billing has many different payers including Medicaid, Medicare, State General Fund, private insurance, and others. Fiscal Management, which is the disbursement of State funds, is processed and categorized through groupings such as Grant Funds, Appropriations, Allotments, and Allocations.

CIMOR also supports State facilities with Event Management & Tracking (EMT). EMT tracks incidents that may result in the compromise of a consumer's safety. Details of incident investigation, individuals involved and follow on progress of the incident are logged into this area.

Some assessments/screenings, which are included, make the appropriate classification of consumers based on certain criteria. Both the results of these assessments and the follow-on diagnoses treatment plans are kept in CIMOR.

2.2 CIMOR Functions and Processes

CIMOR is a comprehensive system developed and tailored to DMH needs. Phase I of this project developed a table of business functions that CIMOR currently performs as well as those that are planned enhancements. Our review of the July 2005 "Electronic Health Record Systems Evaluation" report identified other enhancements. The 2005 evaluation was conducted by Tier for DMH to identify the functional requirements for an electronic medical record (EMR) system. An excerpt of that report set forth in Appendix .

The phrase "enhanced CIMOR" is used frequently in the report. This phrase is defined to mean the current CIMOR system with all planned enhancements completed and operational, including those recommended in the Tier report. This "enhanced CIMOR" then becomes the benchmark against which all other systems are measured. Appendix 2 shows the business functions CIMOR has now along with the planned enhancements. None of the packages examined had all the functions in Appendix 2. Some COTS packages lacked just a few functions while others lacked dozens of functions.

To aid in the analysis and to group business functions into manageable categories, the business functions in Appendix 2 CIMOR Functionality Matrix have been rearranged into the categories presented in Table 2.

Table 2. CIMOR Business Function Categories

Business Function Sub Function Category	Description
1. Administration	Activities to support program administration including human resource functions, incident reporting, system security, interagency communication, consumer banking, internal Service Code Management, organization management support, inpatient room, bed management and Practitioner Group Management, SATOP data collection and pharmacy functions.
2. Counseling & Care & Assessment Management	The process of developing, implementing and tracking plan(s) for service(s) and support(s) for each individual, e.g. capture data related to counselors, treatment plans, support services, referrals out, transfers/closures and outcomes.
3. Electronic Medical Record	A system to support Exchange client Information with Providers; Progress/Case Documentation; Physician and nursing orders; Medical record-related information summarized for quick-view or analysis purposes, and printable summaries of specific actions planned, plan for discharge, consumer referral, consumer treatment plan; electronic medical records of all consumers being served, and Lab function including doctor's orders.
4. Reimbursement for Services	The process of administering accounts payable and accounts receivable. Include the process of ensuring eligibility requirements are followed. Adjudicating claims and ensuring HIPAA translations are appropriately performed.
5. Screening / Intake / Enrollment	The process of completing a group of initial administrative functions necessary to provide behavioral health services to an individual, e.g. capture data related to initial screening, incoming referral(s), registration/admission, financial eligibility, program eligibility, releases and notices, service authorizations, maintain historical data
6. Service Utilization, Outcome Tracking & Reporting	The process of monitoring and reporting behavioral health services utilization and individual outcomes, e.g. robust reporting capacity for individual outcome data, utilization, required federal reports, ad hoc reports, contract/grant performance, census management, wait lists.

2.3 Technical Requirements

The Information Technology Services Division (ITSD) in 2001 elected to use Microsoft .NET architecture for developing CIMOR. .NET supports development of applications that are web-enabled.

One of the major implications of this selection is that the use of .NET provides for global access capability. Rather than being restricted to a local area network or even a wide area network, access restrictions for .NET applications are anywhere the Internet is accessible. This means that the technology is available, if desired, to allow a person's web enabled wireless unit to access CIMOR. For example a physician could use a personal digital assistant (PDA) to scan patient files and create physician orders. An Emergency Medical Technician (EMT) at an accident site could be accessing previous medical conditions and treatments via web enabled

devices as well as providing video to physicians and law enforcement. There is virtually no limit to the communications capabilities that .NET supports.

The ASP.NET page and controls framework is a programming framework that runs on a Web server to dynamically produce and render ASP.NET Web pages. The ASP.NET Web pages can be requested from any browser (i.e., Windows Internet Explorer) or client device, and ASP.NET renders markup (such as HTML) to the requesting browser. As a rule, one can use the same page for multiple browsers, because ASP.NET renders the appropriate markup for the browser making the request. However, an ASP.NET Web page can be designed to target a specific browser, such as Microsoft Internet Explorer 6, and take advantage of the features of that browser. ASP.NET supports mobile controls for Web-enabled devices such as cellular phones, handheld computers, and PDAs.[3]

The Microsoft .NET Framework offers code access security and role-based security as an integral feature. This helps developers address security concerns to ensure that components have the ability to determine what users are authorized to do.

ADO.NET provides consistent access to data sources such as Microsoft SQL Server and Oracle,[4] [5] which are two of the most popular database management system available. Data-sharing applications can use ADO.NET to connect to these data sources and retrieve, manipulate, and update the data that they contain.[6] Also, .NET supports and is compliant with Open DataBase Connectivity (ODBC). Because ADO.NET separates data access and data manipulation into different components and because ODBC is an industry wide standard, CIMOR has a comparatively unlimited ability to connect to other databases regardless of location (given access rights of course).

For a detailed description of hardware and software requirements, pleases refer to Appendix 3 and Appendix 4 respectively.

[3] ASP.NET Overview, http://msdn2.microsoft.com/en-us/library/4w3ex9c2.aspx.
[4] Oracle Developer Tools for Visual Studio .NET with Oracle10g Release 2 ODAC 10.2.0.2.21, http://www.oracle.com/technology/software/tech/windows/odpnet/index.html.
[5] .NET Developer Center, http://www.oracle.com/technology/tech/dotnet/index.html.
[6] Overview of ADO.NET, http://msdn2.microsoft.com/en-us/library/h43ks021.aspx.

3 Description of Methodology

In order to expedite data collection FOX relied on responses to a Request for Information (RFI) sent out on behalf of the State of Oregon in November 22, 2005 for findings concerning the WITS - Web Infrastructure for Treatment Services system, and the Veterans Administration's VistA system. FOX also relied on the results of previous research conducted by the DMH including notes provided by Felix Vincenz. In addition, FOX conducted additional research to gather more information concerning the Texas BHIPS system and Michigan's EnCompass.

FOX sought information from Bond Technologies and MEDITECH by speaking with representatives and asking them to verify functionality matrices. Conversations were also conducted with EnCompass and WITS representatives. Extensive Internet searches were conducted to collect substantial amounts of information.

FOX compared the functionality and technical architecture of each of the alternative systems, both Commercial-Off-The-Shelf (COTS) and public domain, against the CIMOR high level macro functions and processes and technical requirements. Additionally, FOX analyzed the stability of the company and/or product by reviewing and comparing the available corporate information, size of the company, length of time in business, etc. The FOX Team compared the functionality fit, technical architecture, using the rating system in Table 3.

Table 3. Rating Symbols

Rating Symbol	Rating	Rating Description
●	High	This rating is defined as a high compatibility with enhanced CIMOR requirements. For example, it appears to closely match at least 80% of the functions and processes.
◒	Medium	This rating is defined as a medium compatibility with enhanced CIMOR requirements. It looks like it might fit but needs further research to confirm, or the system will need modifications to complete the fit. For example, it matches at least 65% of the functions and processes.
○	Low	This rating is defined as a low or no compatibility with enhanced CIMOR requirements. For example, it matches less than 65% of the functions and processes.

The company/product stability was also ranked on a scale of High, Medium, and Low. The ranking was difficult as the companies are privately held and little direct financial information available about them. Consequently, corporate stability estimates must be made from years in business, company size, etc.

Cost ranges of the software products, and in some cases, implementation management, training and on-going maintenance costs were also noted, where estimated by the COTS vendor or public domain user. If cost information could not be directly obtained, then when and where possible, various assumptions were made and estimated costs were derived.

A summary of all the software packages rated by FOX follows. The COTS vendors and public domain systems are set forth in Table 1.

3.1 Limitations of the Assessment

This report was intended to be a high-level review and not a detailed gap analysis of alternate systems. FOX relied on the results of written material from vendors, DMH notes from previous vendor meetings and telephone conversations to gather information.

3.2 Cost Estimation Assumptions and Methodology

The COTS vendors had to make cost estimates without knowing who the potential client was or anything about the client's business environment. The same is true for the public domain entities. The only pieces of information the vendors had to use were the Functionality Comparison Matrix and their system in Appendix 2.

Due to this extremely limited information all vendors emphasized that the cost estimates were only ballpark guesses. Vendors further indicated that firm numbers could be provided only after consultation with DMH on the exact system requirements. One of the major assumptions made was that regardless of the system selected DMH wants to keep all of the existing CIMOR functions. Thus, if a system lacked one or more functions, then the vendor would have to add that function. In the instance of Open Source software, then ITSD would have to arrange to have the missing functions added. The system purchase / lease price is either obtained from the vendor, published materials, or estimated using a best guess approach. Open Source software is free and thus the cost is $0.

Indicated below are the assumptions used to generate the cost ranges for each system.

1. CIMOR cost estimates provided by ITSD are accurate statements of CIMOR costs.
2. CIMOR cost estimates provided by ITSD are accurate statements of the cost to complete each enhancement.
3. Staff is assumed to have productive hours 1,750 hours per year with an average cost of $70,000 per year including benefit costs of 48%. Therefore, the average fully-loaded hourly rate for an ITSD developer is assumed to be $40.
4. All programming work is to be performed by either contract labor or the vendor at contract labor rates, both of which are defined to $90/hour.
5. A 30% contingency is added to this to account for underestimated hours or rates.
6. With the exception of missing functions, planned enhancements, and the enhancements in Appendix 2, DMH is satisfied with the "as is" capabilities of any system or system enhancement purchased and will change any and all DMH operational procedures and activities to conform to the newly acquired software. This means that no system modifications will be required or are expected.
7. No other costs (e.g., hardware, network, expendables, training, travel, etc.) are required for any activity, item, enhancement, or system other than hours worked. In addition, ITSD will not have to hire any additional personnel to purchase / lease, install, operate, maintain or otherwise staff any system or system enhancement. The exception to this is if Open Source software is selected in which case contract labor will be retained.
8. The cost estimates are incremental costs to those ITSD currently experiences. That is, ITSD would see these additional costs added to its budget.
9. Where the implementation cost was not provided by the vendor it can be calculated using the assumptions below. The amount of time to implement a COTS system is about 3 months. The cost to implement a system is about 10% of the total development cost. The cost to implement a system is computed using MAX(10% total development cost, (3/12) X annual operating cost), where "3" is the three month to

implement and the “12” is twelve months in one year. Note that (3/12) =25%. No additional implementation costs are required or expected beyond those cost estimates calculated. For example, no programming, reformatting, etc., is required or expected beyond that budgeted in the cost estimates. The exception to this is when the vendor provides a specific implementation cost.

10. The annual cost to operate / maintain a system is 10% of the total system development / purchase / lease cost unless otherwise stated (e.g., vendor specifies the cost).
11. The 150,000 individual DMH serves (http://www.dmh.missouri.gov/about.htm) is an accurate, unduplicated count (i.e., unique individuals) of the number of patients DMH serves each year.
12. Maintenance costs are for a full year in the first year.
13. Washtenaw Community Health Organization's implementation costs were $553,512 (http://www.sccmha.org/whats-new/SCCMHA_07_Prog%20Report.pdf) for 20,000 consumer demographic records. The 20,000 is an unduplicated count. Ratio analysis may be used to scale the 20,000 to 150,000 consumers. Likewise other costs associated with EnCompass can be calculated using ratio analysis.
14. The $80 / patient per year for VistA maintenance cost (http://www1.va.gov/opa/pressrel/pressrelease.cfm?id=1152) is accurate and applies to the 150,000 annual DMH patients.
15. The vendors supplying costs for their systems provided a best guess effort to approximate system charges. The vendor's reserve the right to publish a final cost after discussions with the State.
16. The amount of time to finish a partially completed function (e.g., TPL - Private Insurance Billing for BHIPS) is identical the total amount of time estimated to write the function from scratch.
17. DMH does not want to give up any functions they now have in CIMOR if and when a new package is selected. Thus, they must first replace any missing function.
18. Any and all software additions and/or enhancements required prior to and for implementation will be conducted by the vendor. In this instance no surcharge is added to implementation since the vendor is intimately aware of the software. In the event Open Source software is used, then an additional “surcharge” is added to the implementation cost since ITSD and its contract labor will have no experience with the Open Source software and will have to learn by trial and error.
19. The system purchase / lease price is either obtained from the vendor, published materials, or estimated using a best guess approach. Open Source software is free and thus the cost is $0.
20. The cost of implementing missing functions is assumed to be the average estimated cost of implementing enhancements at the contractor rate: $90 hours times 1,750 hours plus a 30% contingency factor or $205,000.
21. If ITSD is responsible for implementing the system (i.e., Open Source), then the formula MAX (10% total development cost, (3/12) X annual operating cost) is adjusted so that the development costs is augmented by the cost of the missing functions and

enhancements. This is done because ITSD and its contractors will not have knowledge about the system.

Cost estimates for this report were prepared using the process described below.

- Individual components such as those shown in the Functionality Comparison Matrix (e.g., Medical Record Maintenance - Physician Order Entry) were not priced separately by vendors. Costs are computed by using an hourly contract rate of $117 times the development hours estimated by ITSD. Example:
    - Estimated hours of ITSD development of Medical Record Maintenance - Physician Order Entry is 3,500 hours ($140,000 times $40 per hour)
    - Estimated cost of Contractor development of Medical Record Maintenance - Physician Order Entry is $410,000 (3,500 hours times $90 per hour, plus a 30% contingency factor rounded to the nearest $1000).
    - Estimated costs less than $1,000,000 are rounded to the nearest $1,000. Estimated costs $1,000,000 and above are rounded to the nearest $10,000.

4 Study Findings

4.1 Introduction

The overall functionality fit to the enhanced CIMOR is shown in Figure 1. Only EnCompass and MIDTECH are rated high. All other systems are rated medium.

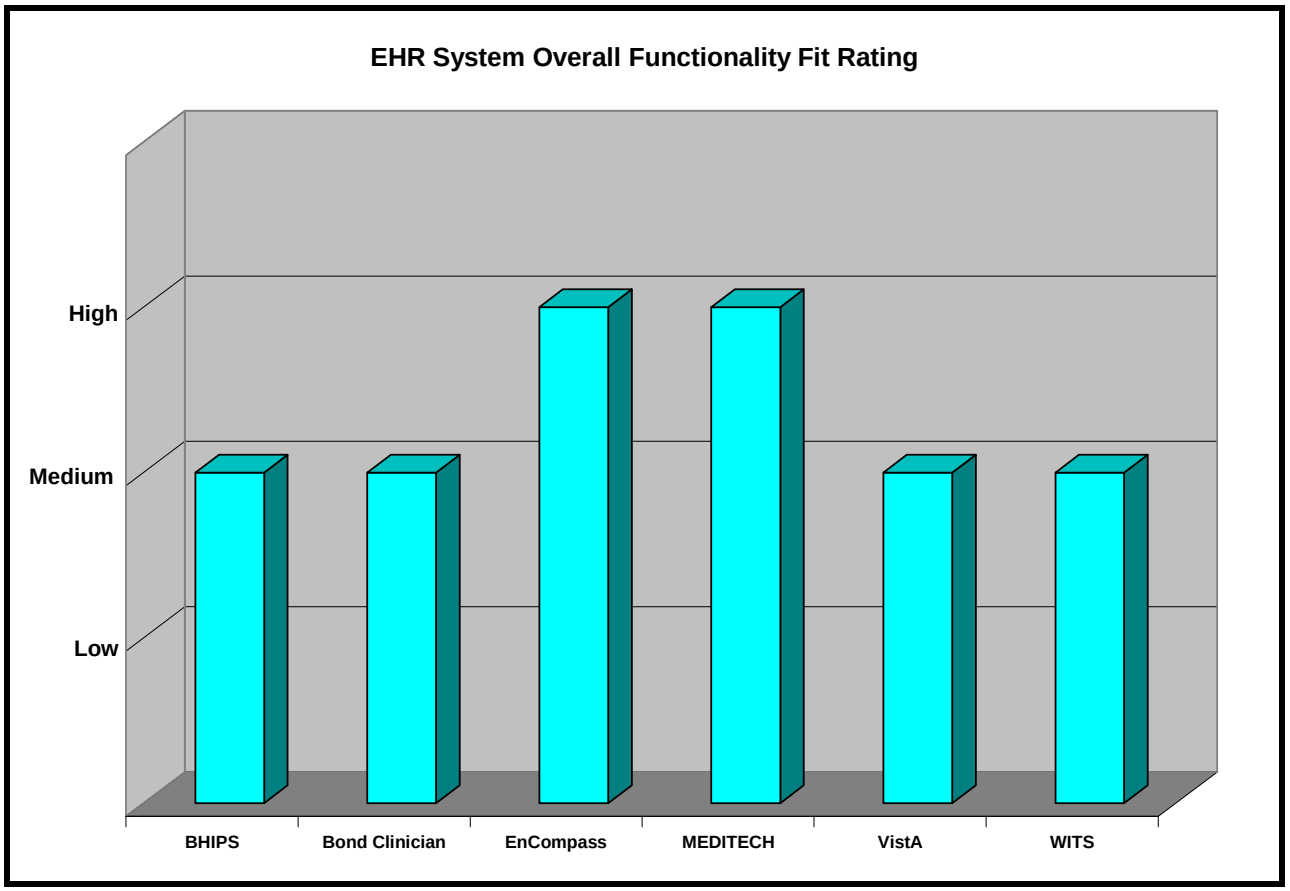

Figure 1 EHR System Overall Functionality Fit Rating

The assumption was made that DMH did not want to give up any current CIMOR functions. Planned enhancements as well as newly discovered enhancements were excluded when determining missing functions. That is a function was determined to be missing if the new COTS package did not have an existing CIMOR business function as defined in Appendix 2 CIMOR Functionality Matrix. As seen in Figure 2, EnCompass has the fewest number of missing functions. MEDITECH has the second fewest missing functions.

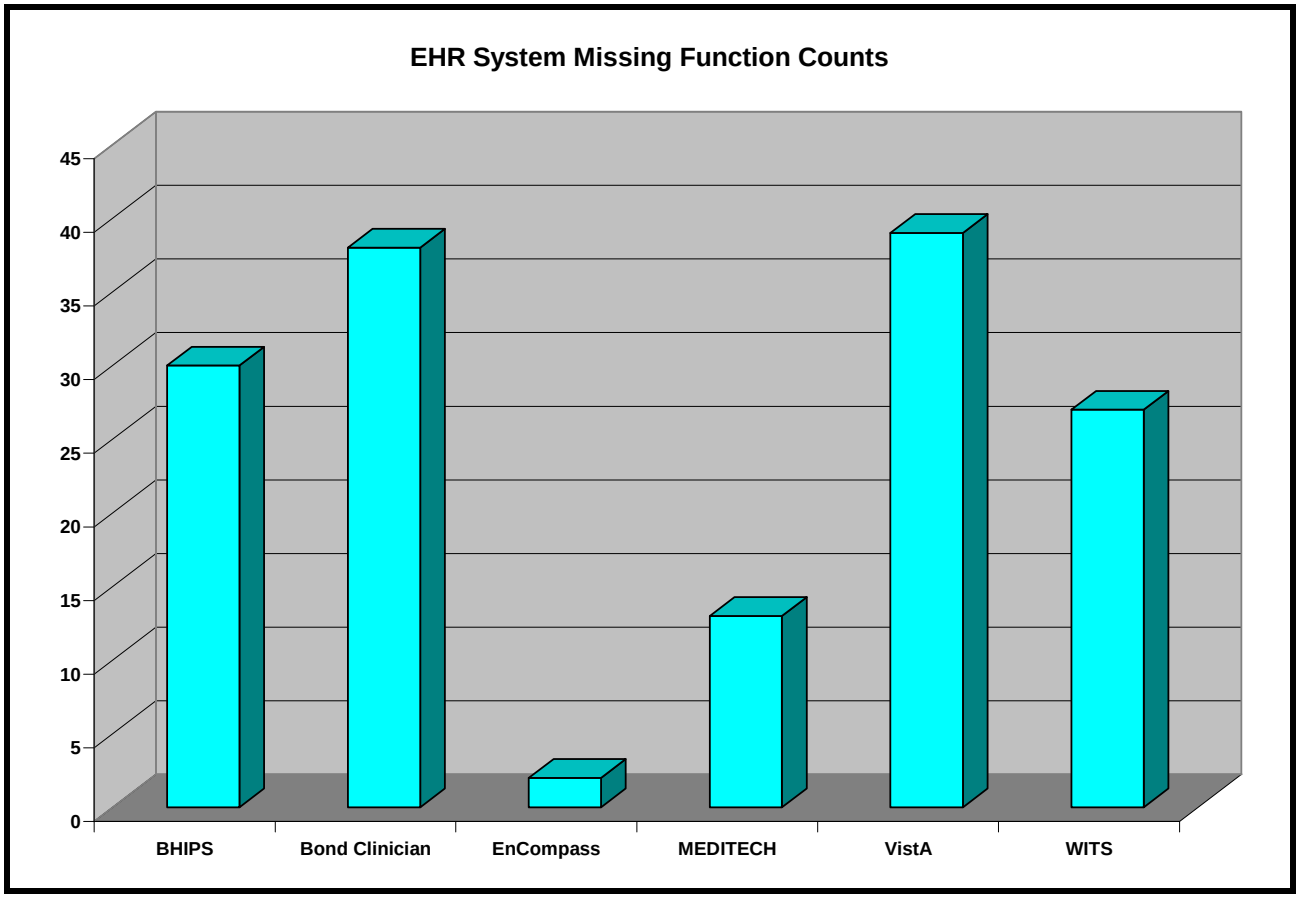

Figure 2 EHR System Missing Function Counts

CIMOR business functions were grouped into six categories for analysis purposes. These six functions and their descriptions are shown in Table 2. These six functions are:

- Administration
- Counseling & Care & Assessment Management
- Electronic Medical Record
- Reimbursement for Services
- Screening / Intake / Enrollment
- Service Utilization, Outcome Tracking & Reporting.

Table 4 shows the business function category comparisons for the COTS packages.

Table 4. CIMOR Business Function Category Comparison

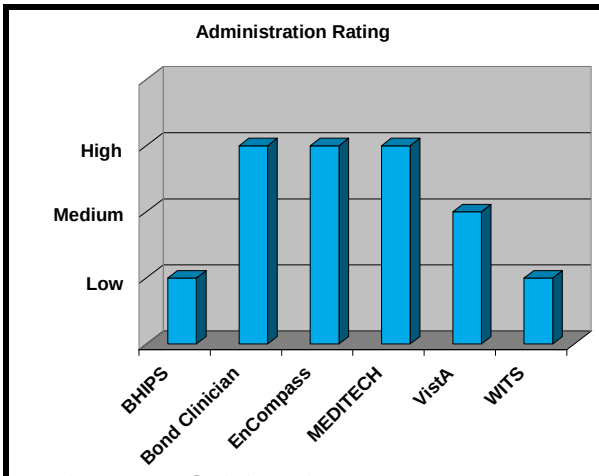

Figure 3. Administration Category Comparison

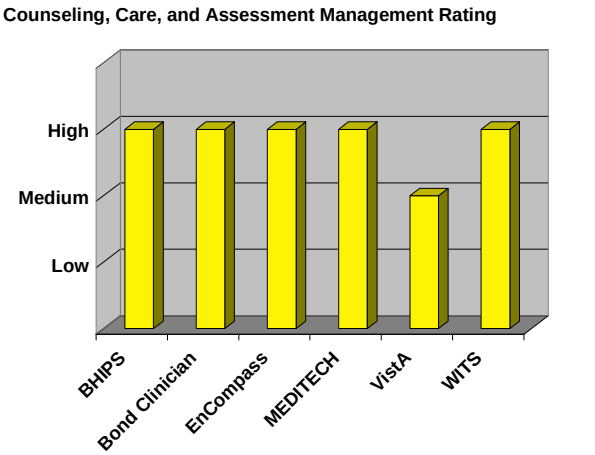

Figure 4. Administration Category Comparison

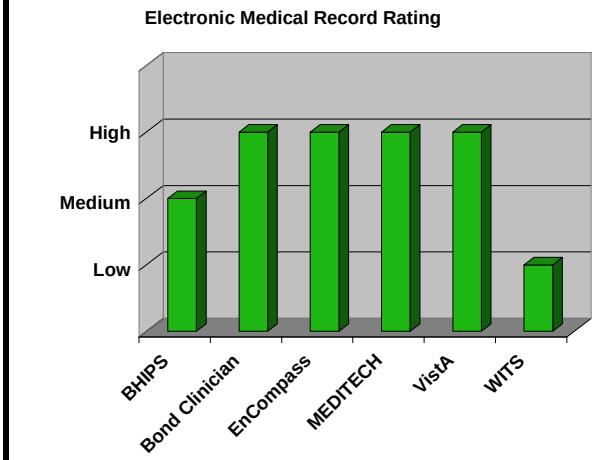

Figure 5. Electronic Medical Record

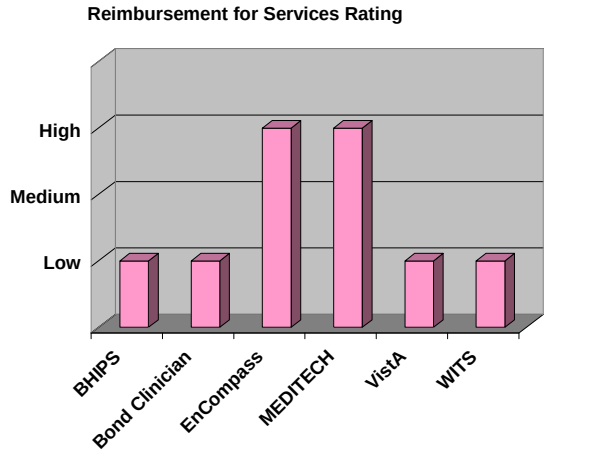

Figure 6. Reimbursement for Services

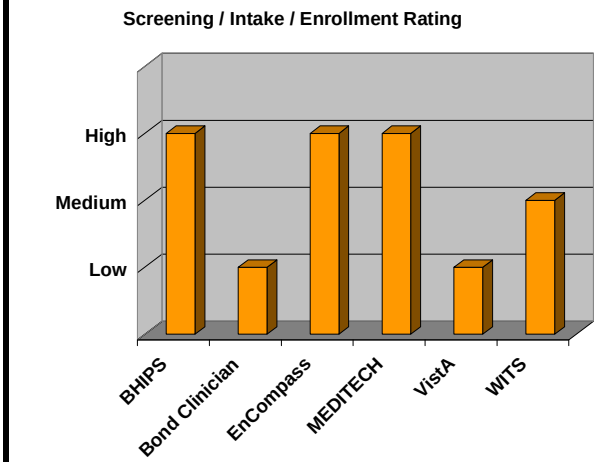

Figure 7. Screening / Intake / Enrollment

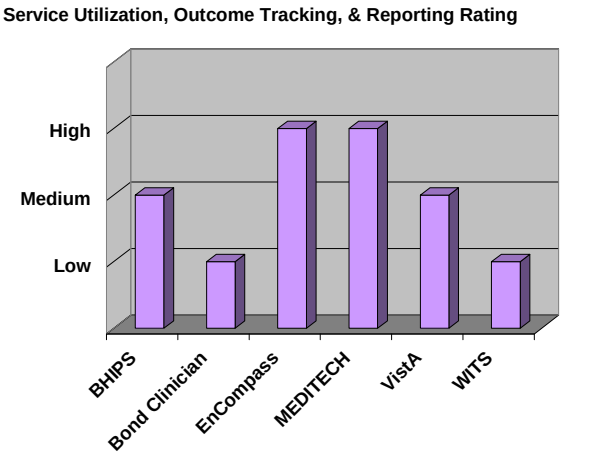

Figure 8. Service Utilization, Outcome Tracking & Reporting

Not surprisingly EnCompass and MEDITECH, the two highest rated COTS packages for overall functionality fit, also have the highest ratings for each of the categories in Table 4.

However, examine Figure 9, and it shows a completely different picture. Here both EnCompass and MEDITECH are rated low on technical architecture. The reason is EnCompass is Linux based, uses DB2, and is hosted. MEDITECH is a client/server platform and uses a proprietary programming language named MAGIC. VistA also uses a unique programming language M (i.e., MUMPS).

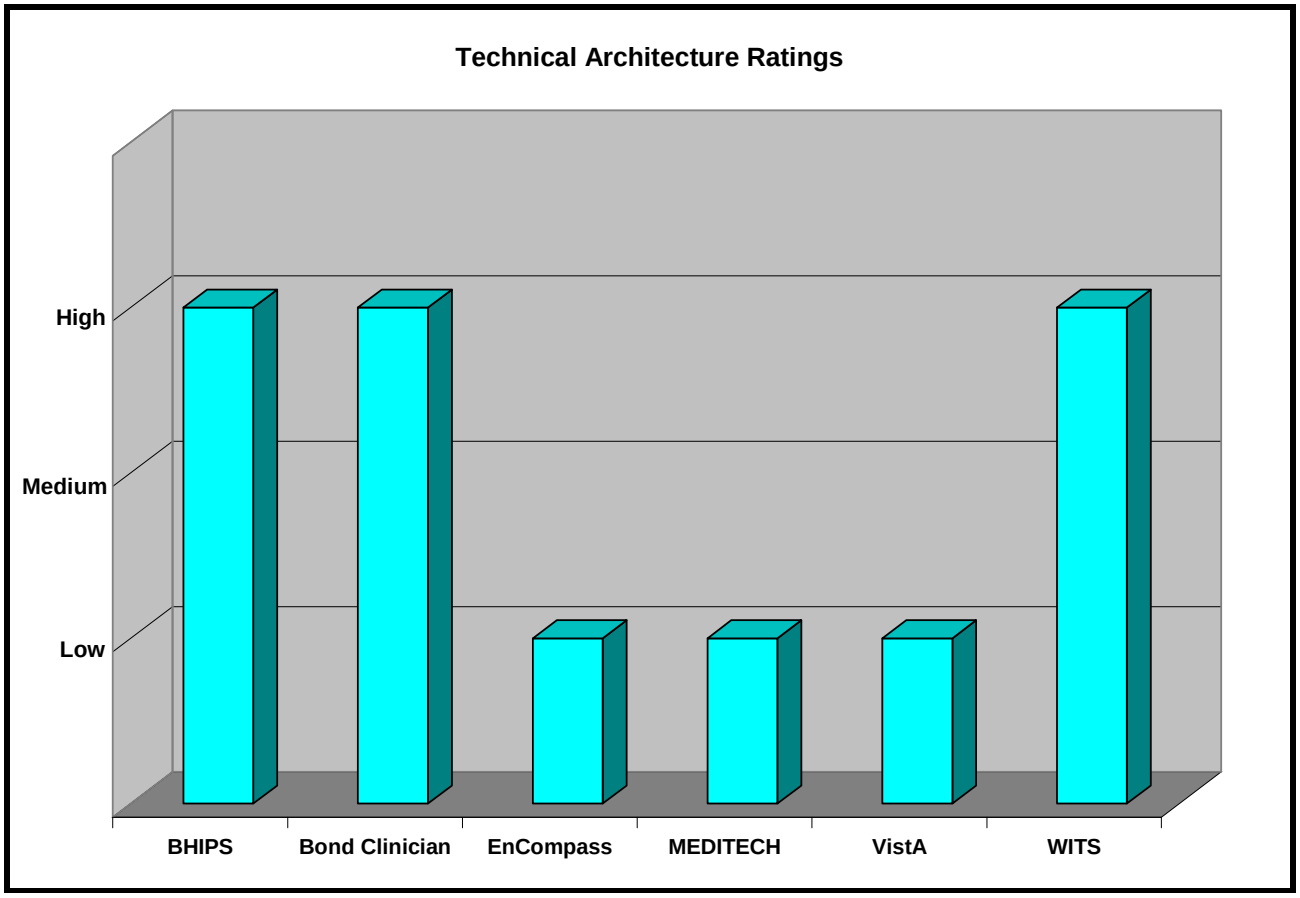

Figure 9 Technical Architecture Ratings

Overall no single COTS package stands out above all the rest. Each package has it strengths and weaknesses.

VistA stands out among all the COTS packages primarily due to cost. It is also the most function rich package. But many of the functions are neither part of the current CIMOR nor planned for any future version of CIMOR.

4.2 Cost Comparison

Cost is always a driver when purchase decisions must be made. Table 5 COTS Cost Comparison and Missing Functionality Count presents a cost comparison of each of the COTS packages. In addition the number of existing CIMOR business functions associated with each

package is presented in line #1. Line #3 shows the estimated cost to replace the missing functions.

Table 5 COTS Cost Comparison and Missing Functionality Count

Line #	Item Category	BHIPS	Bond Clinician	EnCompass	MEDITECH	VistA	WITS
1.	Missing function count	30	38	2	13	39	27
2.	System purchase / lease cost	$0	$6,500,000	$0	$6,500,000	$0	$0
3.	Include Functions Currently in CIMOR	$6,200,000	$8,000,000	$400,000	$3,400,000	$7,800,000	$5,400,000
4.	Implementation cost	$3,360,000	$650,000	$4,150,000	$0	$6,930,000	$1,080,000
5.	Annual operating / maintenance cost	$515,000	$650,000	$420,000	$420,000	$12,000,000	$400,000
6.	Include Functions Not Currently in CIMOR	$1,127,000	$922,000	$0	$615,000	$1,025,000	$1,332,000
7.	Include Data Marts	$876,000	$876,000	$876,000	$876,000	$876,000	$876,000
8.	Total first year costs (excluding enhancements)	$10,075,000	$15,800,000	$4,970,000	$10,320,000	$26,730,000	$6,880,000
9.	Total first year costs (including Enhancements)	$11,202,000	$16,722,000	$4,970,000	$10,935,000	$27,755,000	$8,212,000
10.	Total cost after first year	$515,000	$650,000	$420,000	$420,000	$12,000,000	$400,000

The remainder of this section presents each COTS package in detail.

4.3 Option 1 – BHIPS

4.3.1 Summary of Company Description

The Texas Commission on Alcohol and Drug Abuse (TCADA) developed the Behavioral Health Integrated Provider System (BHIPS). The program was released June 11, 2001, beginning a phased rollout to providers that was completed in November 2002. Many of the business processes designed in BHIPS are modeled on input from provider focus groups as well as the Target Cities model. The Target Cities model emphasizes linkages of information and communication among assessors, case managers, providers, utilization review staff, quality assurance staff, evaluation staff, etc. TCADA's solution combines the case management and reporting capabilities of previous TCADA software and adds additional tools making BHIPS a comprehensive information management network to facilitate cooperation and coordination among providers.[7] (TCADA became part of the Department of State Health Services (DSHS) on September 1, 2004.[8])

BHIPS is Web-based, open-source software that allows behavioral health providers to integrate tracking, clinical, and billing data into a comprehensive behavioral health service delivery system.[9]

The Texas Department of State Health Services (DSHS) states in its FY 2005-2009 Strategic Plan that "…DSHS will expand the Behavioral Health Integrated Provider System (BHIPS)…" [10]

However, the FY 2007-2011 Strategic Plan does not even mention BHIPS. Instead it states the following:

> "The Information Technology capital project, Clinical Management for Behavioral Health Services Project, is underway with goals to define consolidated business processes and to update software applications to enable successful provision of behavioral health services to Texans. This new system will provide a complete electronic health record of a client's progress through the mental health and substance abuse system to ensure continuity of care and accountability for purchased services." [11]

One should also note that David Wanser, Ph.D., Texas Deputy Commissioner for Behavioral and Community Health Services, in his January 24, 2007 presentation to the National Association of State Alcohol and Drug Abuse Directors stated that Texas developed the BHIPS system…and is working on the 3rd version. [12]

Without further research one cannot determine whether BHIPS will be replaced, be the core for the "Information Technology capital project," or continue to be improved as a separate system. Regardless, the State of Texas will have a behavioral health system, and based on David Wanser's 2007 presentation, that system will be BHIPS.

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7 BHIPS Executive Overview, http://www.tcada.state.tx.us/BHIPS/index.shtml.
8 DSHS Substance Abuse Services, http://www.tcada.state.tx.us/.
9 Texas Behavioral Health Integrated Provider System (BHIPS), p. 2, http://www.nasadad.org/resource.php?base_id=902.
10 Health and Human Services System Strategic Plan FY 2005-2009, Chapter IX - Department of State Health Services External/Internal Assessment, p. 180, http://www.hhs.state.tx.us/StrategicPlans/HHS05-09/HHS_StPlan_rv.shtml.
11 Health and Human Services System Strategic Plan FY 2007-2011, Chapter IX - Department of State Health Services External/Internal Assessment, p. 260, http://www.hhs.state.tx.us/StrategicPlans/HHS07-11/HHS_StPlan.shtml.
12 Dave Wanser, Increasing Interoperability in Health Information Systems, p. 8, http://www.nasadad.org/resource.php?base_id=897.

4.3.2 Summary of Product Description

BHIPS is an on-line, real-time, web-based application. All that is needed to use the system is a PC with an Internet connection and security access to the system. Funded Texas providers, state-wide, are required to enter and access data through the system. DSHS provides reports to providers that indicate client progress while in treatment so that decisions about the treatment approach may be made when necessary. DSHS also provides on-demand reports to providers comparing their outcomes to contracted performance measures and comparing their outcomes to the rest of the State. These reports help the providers identify performance shortcomings so they can improve their processes. [13]

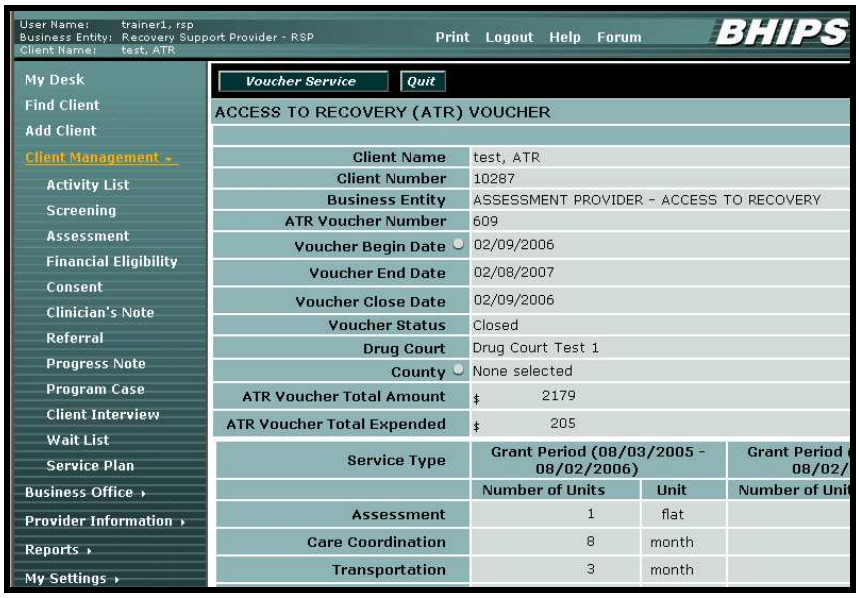

Figure 10. Part of BHIPS Access to Recovery Voucher Screen

The system went into full production in June 2001. [14] The BHIPS is a component of a much larger system. It sits on top of a fully integrated enterprise-wide database that not only contains BHIPS data but also includes all other departmental related data such as contracts, budget, billing, etc. [15]

The reader should also note BHIPS is an award winner. BHIPS is a 2006 Davies Public Health Award Recipient. [16] HiMISS, which made the award, encourages and recognizes excellence in the implementation of EMREHR systems. [17] Thus, BHIPS has demonstrated its strengths on a national scale.

4.3.3 Technical Platform Description

BHIPS is an on-line, real-time, web-based application. BHIPS was developed using state-of-the-art technology. The application was initially developed using Active Server Pages (ASP) and Microsoft Visual Basic. [18] BHIPS has recently been re-written in Microsoft .NET using a

[13] Texas Behavioral Health Integrated Provider System (BHIPS), p. 15, http://www.nasadad.org/resource.php?base_id=902.
[14] Texas Behavioral Health Integrated Provider System (BHIPS), p. 17, http://www.nasadad.org/resource.php?base_id=902.
[15] Texas Behavioral Health Integrated Provider System (BHIPS), p. 17, http://www.nasadad.org/resource.php?base_id=902.
[16] HIMSS Nicholas E. Davies Award of Excellence, p. 5, http://www.himss.org/content/files/davies/2007/2007_PubHealth_AppProcess.pdf.
[17] HIMSS Nicholas E. Davies Award of Excellence, p. 4, http://www.himss.org/content/files/davies/2007/2007_PubHealth_AppProcess.pdf.
[18] Texas Behavioral Health Integrated Provider System (BHIPS), p. 16, http://www.nasadad.org/resource.php?base_id=902.

framework that allows the application to be database independent. It also allows the sharing of functionality across states reducing the effort on all using the common framework. [19]

The system was originally written to use Sybase. Now the system uses Microsoft 2003 servers and Enterprise SQL Server Database (either Sybase or Microsoft). BHIPS is written in the C# language. [20]

BHIPS is available as an Open Source application

4.3.4 System Functional Strengths

As shown in Table 1 BHIPS has a functional medium fit with the enhanced CIMOR system. This is because the current BHIPS does not have all the functionality expected of the enhanced CIMOR.

Table 6. BHIPS Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	Low
2.	Counseling & Care & Assessment Management	High
3.	Electronic Medical Record	Medium
4.	Reimbursement for Services	Low
5.	Screening / Intake / Enrollment	High
6.	Service Utilization, Outcome Tracking & Reporting	Medium

The fit for each BHIPS section when compared to the enhanced CIMOR is shown in Table 6 and Figure 11.

The reader should note that BHIPS "sits on" other systems such as accounting. Thus, BHIPS itself has links to information in other systems in some instances. The scope of this situation is unknown and could result in modifying the fit rating if substantial functionality is performed by other applications. The BHIPS functions that likely have interfaces to other applications are denoted in BHIPS footnote 1 in the Functionality Comparison Matrix. Thus, both Table 6 and Figure 11 assume these issues have been resolved prior to implementation.

[19] Texas Behavioral Health Integrated Provider System (BHIPS), p. 17, http://www.nasadad.org/resource.php?base_id=902.
[20] Texas Behavioral Health Integrated Provider System (BHIPS), p. 40, http://www.nasadad.org/resource.php?base_id=902.

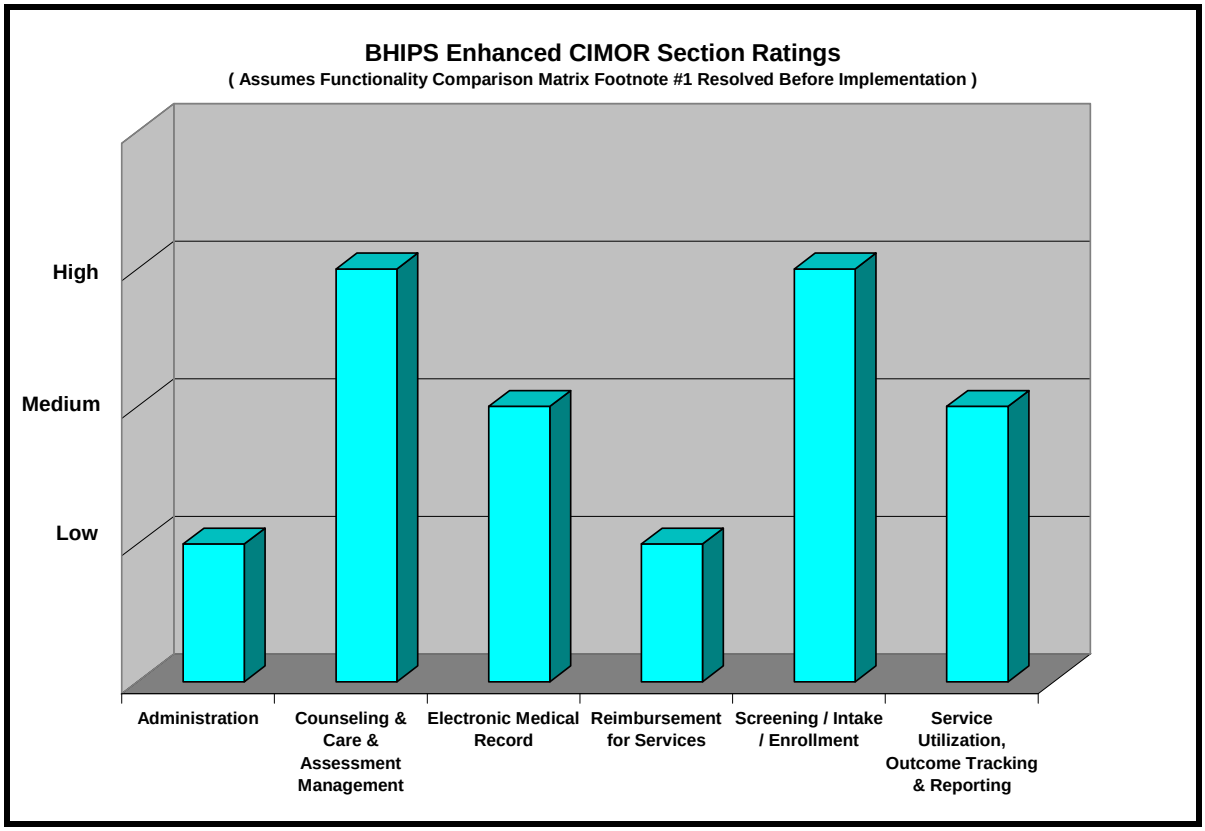

Figure 11. BHIPS Enhanced CIMOR Section Ratings

From a functionality perspective BHIPS has the following section strengths:

- Counseling & Care & Assessment Management — High
  1. Screening / Intake / Enrollment — High
- Electronic Medical Record — Medium
- Service Utilization, Outcome Tracking & Reporting — Medium

Because BHIPS is a comprehensive system, it already has some of the enhancements planned for CIMOR. These include the following:

- DMH Intra-agency Communication - 46
- Long Term Treatment, Discharge and Aftercare Planning - 63
- EMR Maintenance: Crisis Action Plan View - 65
- EMR Maintenance: Discharge Plan - 66
- EMR Maintenance: Referral View - 67
- EMR Maintenance: Treatment Plan View - 68
- Registration / Admission / Program Assignment: Referrals Management - 90
- EMR Maintenance - 105
- Case Management: Consumer Group Management - 21
- Registration / Admission / Program Assignment: Referrals Management - 90
- Exchange client Information with Providers – 109.

The Appendix contains the Functionality Comparison Matrix in which the reader may compare BHIPS to the other systems. In addition the individual function compatibilities (i.e., Yes / No value) may also be observed.

BHIPS has the functionality shown in Table 7.

Table 7 BHIPS Functionality[21]

Line #	Functionality	Description
1.	Client Profile (demographics)	When a client presents for treatment, the counselor collects basic demographic information in the Client Profile. This record becomes the anchor for the clinical file.
2.	Screening Instrument	After the Client Profile is collected the clinician performs a brief Screening. If the score on the screening indicates potential substance abuse problems, the counselor completes a full assessment.
3.	Addiction Severity Index Assessment (ASI-Lite)	The assessment instrument is based on the Addiction Severity Index (ASI)—Lite and collects information about the client's history and current status. It is divided into sections that include collection of general, medical, employment, substance use, legal, family, and psychiatric history and current status of the client. There is summary that extracts significant information from all sections of the assessment onto one screen, providing a single place to view important information without having to page from section to section. This information helps the provider when making decisions regarding a client's need for treatment for a substance abuse, dependency problem or mental health problem and to make a diagnosis and determine the client's level of severity. If the client is eligible for services, placement criteria is used to determine the type of services the client needs and the client is admitted for treatment.
4.	Clinician's Assessment	A progress assessment tool is also available to provide a quantitative measure of the client's clinical progress over the course of treatment. The Clinician's Assessment collects information about the clinician's observations of the client. It is somewhat subjective in nature but allows the clinician to capture educated opinions on the client's current status. To aid in selecting the correct rating, a description of the symptoms the client would exhibit were he/she extreme, is given. The rating may be scaled back based on the clinician's observations and impressions. This assessment is repeated throughout the cycle of care. The first time this information is collected is in the initial assessment. It is also performed over the course of treatment and at the end of treatment; the counselor completes the Discharge Report which also contains the Clinician's Assessment. When a rating is selected, it gets stored with a numeric value, i.e., None = 0, Extreme = 4. A BHIPS report is available where the numbers from the various iterations of the clinician's assessment are displayed. It provides a tool to aid in the determining whether the client is improving. Using this instrument, the clinician can see a picture of the client's progress from the time the client presented for treatment, throughout treatment and at the time of Discharge.
5.	DSM-IV Diagnostic Instrument	The DSM-IV Diagnostic instrument summarizes the assessment, collecting a diagnostic impression. This impression is multi-axial in that it captures the state of the client's alcohol and drug abuse and mental health disorders, personality and mental retardation, medical conditions, psychosocial and environmental problems, and assessment of the client's functioning.
6.	Access to Recovery (ATR) Voucher	This functionality manages the treatment and recovery support services to clients involved in the criminal justice system through drug courts or probationers. A client is evaluated by an independent assessment provider using the instruments in the BHIPS and determines the client's needs. Services provided are residential and outpatient services as well as recovery support services including but not limited to Childcare, Transportation, Relapse Prevention, Family counseling, etc. A voucher is created for the client and is

[21] Texas Behavioral Health Integrated Provider System (BHIPS), p. 48, http://www.nasadad.org/resource.php?base_id=902.

Line #	Functionality	Description
		good for one year or until the client leaves the ATR program.
7.	Financial Eligibility	Providers are required to determine whether an applicant is financially eligible to receive services funded by DSHS. The necessary information is gathered and the BHIPS calculates whether the applicant is financially eligible and whether or not the applicant will be responsible for payment of a portion of the treatment provided. Billing is blocked when a client is not financially eligible for state funded services or is responsible for a portion of his/her treatment. The federal poverty level is used along with a sliding fee scale to determine financial eligibility.
8.	Treatment Plan	The information collected in the assessment is also used to develop a treatment plan for the client. The Treatment Plan is generated from a completed Assessment. A comprehensive list of client problems is created based on how the client responds to specific questions in the Assessment. This insures that no problems go unidentified and unaddressed. You may add goals, objectives and strategies to the problems to be treated. Clinician's may also refer and defer problems. The Treatment Plan also includes a Discharge Plan. Multiple versions of the Treatment Plan are maintained so updates can be made and the history of the plan can be kept.
9.	Treatment Plan Review	Periodically, the counselor completes a Treatment Plan Review and revises the Treatment Plan to adjust to the changing needs of the client. The Treatment Plan Review is generated from the Treatment Plan. Progress toward goals on all problems with a status of 'Treat' is a required element as well as justification for continued length of stay, transfer or discharge. A history of the Treatment Plan Review is also maintained.
10.	OSAR Residential Approval	Treatment providers need authorization to place a client in residential services. Outreach, Screening, Assessment and Referral (OSAR) providers evaluate clients and refer them to the appropriate treatment provider that offers the services needed as indicated by the client's severity. If the client presents at the treatment provider instead of the OSAR, the treatment provider evaluates the client and requests approval for residential services if they are needed. OSAR approval is based on DSHS placement criteria. Should the client need more time in residential service than has been approved, there is an extension process where the OSAR approves or denies additional residential services.
11.	Admission Report	An Admission Report is used to complete the admission process and capture the client's baseline data. The BHIPS already knows whether the client is an adult or youth from the Client Profile record so the appropriate form is automatically loaded when you select the Admissions menu item. When this form is saved, the provider may begin submitting claims to DSHS for reimbursement.
12.	Progress Notes	As services are delivered, the counselor documents the treatment in Progress Notes that are tied to objectives in the client's treatment plan, ensuring that all services provided are matched with the client's needs. The Progress Note captures the client's progress in counseling and reflects the results of a specific service provided. Once a progress note is saved for a billable service, a HIPAA Pending Claim is generated for submission to DSHS for payment.
13.	Didactic/Educational Progress Notes	The Didactic/Educational Group Notes screen is used to capture and display the didactic and educational services provided for a large group. Up to 35 patients can be selected and when saved, each patient's Activity List is populated with the group note. Billable claims are generated for submission to DSHS for payment.
14.	Discharge Reports	The Discharge screen is used to collect discharge information and is filled out at the time a client is discharged or transferred from a provider facility. All of the DSHS required data is captured when filling out this form. The system determines if the client is an adult or youth from the Admission Report and automatically loads the appropriate discharge form. The system does not allow a client to receive additional services, progress reports, discharges, or follow-ups without having another active Admission Report.

Line #	Functionality	Description
15.	Discharge Summary	A Discharge Summary is prepared that outlines the client's needs, treatments the client received, progress toward goals etc.
16.	Follow-up Reports	The Follow-Up form is used to collect and display follow-up information. The BHIPS knows whether to display an Adult, Youth, or Detox Follow-up from the client's Admission report. Follow-up information is collected at various intervals after the client has been discharged. The frequency of follow-ups is determined by the provider and the number of Follow-up reports associated with the discharge is unlimited. All of the DSHS required data is captured when filling out this form.
17.	HIPAA Compliant Billing Transactions	As a by-product of providers entering clinical data into the system, BHIPS generates HIPAA compliant transactions for payment of substance abuse and mental health services provided.
18.	Automated Messaging/ Reminders	Automated messages remind clinicians when processes and documentation are coming due. This helps the clinician stay current with each client's treatment and insures they are complying by DSHS rules and Federal and State reporting requirements. There is a My Desk screen that is displayed when logged on to BHIPS or when clicking the My Desk button on the BHIPS navigation menu. This screen displays a list of messages that were generated from within BHIPS, such as referrals, referral responses, assessment is due, treatment plan review is due, etc. and system messages. Navigation to the appropriate place in the BHIPS is accomplished by clicking on the message.
19.	Automated Release of Confidential Information/Revoke of Consent	To facilitate continuity of care among different providers, BHIPS automates the process for obtaining client authorization to release confidential information and allows authorized providers to share information electronically. It is a federal law that a hard copy of the form must be filled out, printed, signed, and filed in his/her record to release. When the Consent form is saved in BHIPS, the disclosee has immediate access to the information indicated on the Consent form unless the consent is revoked by the client. When a Consent form is saved, changes to it are prohibited. If a mistake is made, the user may either revoke the Consent form previously saved, or create a new one to replace the original. Revoking Consent removes the ability of the user to disclose or view the information.
20.	Automated Client Referral/Transfer	When a client authorizes the release of confidential information, the clinician can refer a client to another service provider using the Referral screen. The Referral screen is used to collect and display referral information and to send the referral to the receiving provider. When the Send Referral button on the Referral screen is selected, BHIPS creates a Referral record and sends a message to the receiving provider's intake coordinator. Once a referral has been sent it cannot be changed or deleted. Note: Before you can send a referral you must obtain the client's signed consent to release confidential information to the receiving provider. If the client refuses to sign a Consent form, the referral may not be made using the BHIPS automated process. The BHIPS will display an error message if a referral is submitted with no active Consent form in the system for the receiving provider.
21.	Wait List	The Wait List screen is used to place clients on a Wait List. The entire list is accessible by using the On-line Wait List report.
22.	Available Capacity	The Available Capacity screen is used daily to report capacity. Reports are available to the public from the BHIPS homepage so individuals seeking services will know where there are openings.
23.	Staff Member Tracking	The Provider Staff screen is used to collect and display general information about a staff member. If the staff member is currently employed, his/her name is available on all the forms in the system, where staff assignments are made.
24.	Role Based Application Security	Access to the BHIPS requires that each staff member have a logon ID and a password. The staff member must also be assigned one or more roles. Roles are based on different jobs in the organization and are used to limit access to screens to only those needed to perform the job.

Line #	Functionality	Description
25.	Reports and Downloads	The BHIPS has many reports that may be run on demand. These reports come from two different sources of data. A few reports come from the on-line system where the data is as up to date as the last transaction entered into the system. However, most of the reports are created using data from the BHIPS data warehouse. Each night all new and changed records are extracted from the BHIPS and added to the BHIPS data warehouse. This data is kept separate from the on-line system so large or complicated reports can run without degrading the response time of the on-line system. Any of the reports may be downloaded into a Microsoft Excel spreadsheet or a Microsoft Word document.
26.	Assign Staff Access	With the Assign Staff Access screen, DSHS managers may assign view-only access to a provider's data for a specified amount of time. The client's name is masked so the staff member does not see it. This is useful in performing audits and monitoring.
27.	Case Management	Using the Case Management functionality in the system allows case managers/counselors to keep track of services (treatment and non-treatment) provided for clients. Once a case is opened, a clinician can enter services, referrals, and referral follow-ups.
28.	HEI Measures and Narrative	HIV Early Intervention (HEI) programs perform case management; provide services, client referrals and follow-ups to see if the client made contact. The HEI Measures and Narrative functionality generates a quarterly report, summing these activities and calculating performance measures from the data. It also has a narrative section for reporting progress, problems and plans for the program.
29.	Performance and Activity Measures Monthly Report	Prevention and Intervention providers are required to report their performance and activity measures monthly. Measures include numbers served and demographics.
30.	Check Capacity	Providers report bed capacity for residential programs each morning by 11:00 am. The Check Capacity functionality aids providers in finding openings with other organizations when they do not have room.
31.	Pending Claims	Each time a billable service is recorded for outpatient or residential services, a claim is generated on the Pending Claims screen. Selecting a link on a claim will present the appropriate HIPAA transaction (837-Professional for Outpatient or 837-Institutional for Residential) for submission to DSHS for payment.
32.	Outpatient or Residential Claim	Submitting a pending claim will bill DSHS for services provided. HIPAA transaction codes and modifiers are automatically generated based on the service type selected when the service is recorded.
33.	Claim Status	Once a pending claim has been submitted, the Claim Status List screen is used to track the status of the claim. Each claim can be accessed using the link to the claim.
34.	Payment Notification	When a payment is made, a HIPAA compliant 835 Payment Notification record is available for view by selecting the link to the record on the Claim Status screen.
35.	BHIPS Forum	BHIPS has a bulletin board where users may communicate among themselves, sharing ideas and asking questions. DSHS also uses The Forum for communicating new and changed functionality in the system.
36.	Curriculum Outcome Measures	Providers report quarterly on the outcomes of prevention and intervention classes provided at schools and community sites.

4.3.5 System Functional Weaknesses

DMH serves 150,000 consumers annually.[22] During Phase I of this project, ITSD stated that CIMOR has about 2,000 concurrent users each day, about 500 of which are providers. Further, ITSD stated that DMH would have approximately 2,500 providers and approximately 4,000 CIMOR users after all DMH divisions are added.

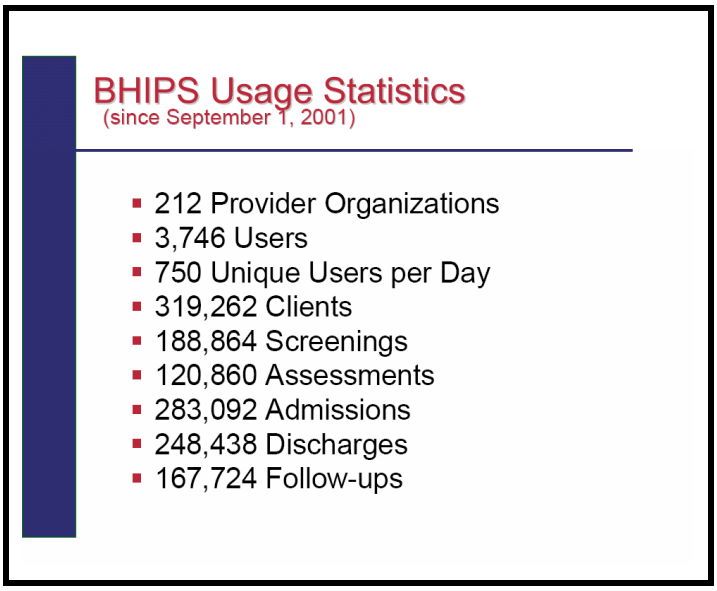

Figure 12. BHIPS Usage Statistics

At the January 24-25, 2007 CMS / Substance Abuse and Mental Health Services Administration (SAMHSA) project meeting Increasing Interoperability in Health Information Systems for Medicaid, Mental Health, and Substance Abuse Treatment David Wanser made the presentation "Maximizing Web-Based Technology in Behavioral Healthcare."[23] In this presentation he has the slide shown in Figure 12.

Figure 12 has the parenthetical expression "since September 1, 2001." Thus, the numbers in the figure are not completely clear for comparison with DMH. Regardless, if the assumption is made that the parenthetical expression means that statistics have been continuously collected since 2001 and the numbers in the figure are annual numbers, then Texas dwarfs Missouri's 150,000 annual clients. If there is an average of 12 providers per organization in Figure 12, then Missouri and Texas would have about the same number of providers.

On the other hand if Figure 12 numbers are indeed cumulative over six years, then BHIPS would not appear to be sized to handle Missouri's workload.

If ITSD were seriously to consider adopting BHIPS, this sizing issue requires clarification.

Because BHIPS is a comprehensive system, it already has some of the enhancements planned for CIMOR. However there are still some enhancement functions that are missing from BHIPS. These include the following:

- EMR Maintenance: Physician Orders - 62
- EMR Maintenance: Summary Views - 64
- Medicare, Medicaid, and Private Insurance: BizTalk MEIS Interfaces - 69
- EOC Forensic Services - 102
- EMR Maintenance: Lab – 106

[22] About the Missouri Department of Mental Health, http://www.dmh.missouri.gov/about.htm.
[23] Dave Wanser, Maximizing Web-Based Technology in Behavioral Healthcare, p. 11, http://himss07.org/docs/sphandouts/42.pdf.

4.3.6 Estimated Cost Range

Approximately 85% of BHIPS' developmental costs were funded via federal block grant money. The remaining 15% came from Texas general revenue. [24]

External contractors were hired to develop BHIPS, but many of the DSHS' internal information technology staff also played a role in BHIPS development and/or support—the equivalent of 2.18 full-time staff. The agency already had a robust information technology infrastructure to support other applications, including the enterprise database, servers, data warehouse and an Internet access system. Some hardware and software components were required to supplement the existing architecture. [25]

Table 8. BHIPS Estimated Costs

Line #	Annual Operating Cost Item	Cost
1.	**Missing function count**	30
2.	**System purchase / lease cost**	$0
3.	**Include Functions Currently in CIMOR**	$6,200,000
4.	**Implementation cost**	$3,360,000
5.	**Annual operating / maintenance cost**	$515,000
6.	**Include Functions Not Currently in CIMOR**	$1,127,000
7.	**Include Data Marts**	$876,000
8.	**Total first year costs (excluding enhancements)**	$10,075,000
9.	**Total first year costs (including Enhancements)**	$11,202,000
10.	**Total cost after first year**	$515,000

As shown in Table 8 the purchase price of BHIPS is $0 since BHIPS is Open Source software.

The assumption has been made that since the BHIPS system would be acquired from Texas that no one on the ITSD staff or any contractor retained would be familiar with BHIPS. Hence additional costs implementation should be anticipated due to a lack of system knowledge; our estimated implementation cost takes this into account.

[24] Texas Behavioral Health Integrated Provider System (BHIPS), p. 20, http://www.nasadad.org/resource.php?base_id=902.
[25] Texas Behavioral Health Integrated Provider System (BHIPS), p. 20, http://www.nasadad.org/resource.php?base_id=902.

4.4 Option 2 – Bond Technologies

4.4.1 Summary of Company Description

Incorporated in 1994 Bond Technologies is headquartered in Tampa, Florida. It is a privately held company funded by private investors and several other companies. According to Bond, viability is ensured through commercial property, marine interests, and agriculture, as well as commitment to its investors and customers. Bond Technologies currently employs over 100 people. These employees include a staff of clinical specialists, certified technology experts, and sales and customer service personnel. Bond Technologies has a fully trained and certified distribution network of providers for local installation, training, and support as well as online options for 24-hour access. [26]

Figure 13. Part of Bond Clinician EHR Claims Screen

Bond Technologies has combined .NET architecture and clinical databases to offer Bond Clinician™ EHR, which they claim is the Digital Medical Office of the Future. Bond Technologies states that implementation of Bond Clinician EHR begins with a hardware and workflow assessment, continues with a clinical and practice administration team for training, and maintains itself with interactive and online updates so that systems receive current information each day. [27]

Note: The Certification Commission for Healthcare Information Technology (CCHITSM) on October 23, 2006 announced that Bond Technologies was CCHIT Certified for its product, Bond Clinician™ EHR and meets CCHIT ambulatory electronic health record (EHR) criteria for 2006. [28]

Appendix 5 provides an analysis of how Bond Clinician™ compares to the CCHIT Functionality for 2006 Certification of Ambulatory EHRs Effective May 1, 2006.

4.4.2 Summary of Product Description

Bond Clinician provides an electronic patient record. It includes a customizable Central Command Center for workflow-driven access to information and Worklists-at-a-glance. It also supports a fee schedule system that actively manages insurance contracts. Additional EHR feature enhancements include customizable and robust flow sheets, advanced protocols and order sets, retail and inventory management functionality, as well as multiple enhancements to encounter notes. Kiosk functionality allows patients to access the patient portal from the physician's waiting room for self check-in, paying co-pays with credit cards, as well as to receive

[26] Bond Technologies Press Kit, http://www.bondclinician.com/nep_press_kit.html.
[27] The Bond Technologies Team, http://www.bondclinician.com/co_info.html.
[28] Bond Technologies' Bond Clinician™ EHR Receives CCHIT Certification, http://bondehr.com/nep_news.html#CCHIT_Certification.

visit instructions. Communication feature enhancements include secure patient email, as well as both physician and employer portals. [29]

In addition Bond Technologies continues to offer its patient portal, clinical content and decision-making support, iClinician™ Mobile solution, Clinician Image Management (CIM), and advanced Query Builder reporting module, with no add-on costs. [30]

Bond Clinician provides an overview of each day's activities with the ability to drill down to the required level of specificity. All system functions are executed in real-time so that the system is always up-to-date. The system has the capability to be customized to each user's role.

Patient status may be viewed either from an individual patient level or aggregated to the enterprise level. With this capability one may be able to see who has what condition or how many patient rooms are available.

The system has a comprehensive clinical encounter functions that provides for such capabilities as: [31]

- Hundreds of templates in multiple specialties for taking notes
- Drug formularies, diseases, alternative treatments, and drugs, available in English and Spanish
- E-Prescribing
- Customizable protocols (order sets) allow you to control medical processes
- Flow sheets allowing selected data to be tracked over time so as to detect trends
- Proactively monitor patient population and alert appropriate users to respond
- Electronic ordering of labs
- Communicate with others by sending referral and follow-up letters, directly from the encounter note
- Create and manage customized orders.

Bond Technologies Clinician EHR also provides capabilities allowing patients to stay in touch with physicians and their charts. Patients can update daily medical logs, request refills and referrals, access patient information, and complete pre-visit forms. [32]

4.4.3 Technical Platform Description

Bond Technologies Clinician is developed using ASP.Net 2.0 Framework, which means the application has the ability to run on any recent Microsoft operating system with Microsoft Internet Explorer. Clinician uses Microsoft SQL as its database system. The system uses n-tiered architecture. [33]

[29] Bond Technologies Launches Bond Clinician EHR/PM, Summer 2006 Release, http://bondehr.com/nep_news.html#summer_release.
[30] Bond Technologies Launches Bond Clinician EHR/PM, Summer 2006 Release, http://bondehr.com/nep_news.html#summer_release.
[31] Bond Clinician Clinical Encounters, http://www.bondclinician.com/bc_features_clinical_encounters.html.
[32] Bond Clinician Patient, Physician, & Employer Portals & Kiosk, http://www.bondclinician.com/bc_features_patient_portal.html.
[33] Technology & Security, http://www.bondclinician.com/bc_features_technology_security.html.

4.4.4 System Functional Strengths

As shown in Table 1 Bond Technologies Clinician has a medium functional fit with the enhanced CIMOR system. This is because the current Bond Clinician does not have all the functionality expected of the enhanced CIMOR.

Table 9. Bond Clinician Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	High
2.	Counseling & Care & Assessment Management	High
3.	Electronic Medical Record	High
4.	Reimbursement for Services	Low
5.	Screening / Intake / Enrollment	Low
6.	Service Utilization, Outcome Tracking & Reporting	Low

The functional fit for each Bond Clinician section when compared to the enhanced CIMOR is shown in Table 9 and Figure 14.

From a functionality perspective Bond Clinician has the following section strengths:

- Administration High
- Counseling & Care & Assessment Management High
- Electronic Medical Record High

Because Clinician is a comprehensive system, it already has most of the enhancements planned for CIMOR. These include the following:

- DMH Intra-agency Communication - 46
- EMR Maintenance: Physician Orders - 62
- Long Term Treatment, Discharge and Aftercare Planning - 63
- EMR Maintenance: Summary Views - 64
- EMR Maintenance: Crisis Action Plan View - 65
- EMR Maintenance: Discharge Plan - 66
- EMR Maintenance: Referral View - 67
- EMR Maintenance: Treatment Plan View - 68
- Registration / Admission / Program Assignment: Referrals Management - 90
- EMR Maintenance - 105
- EMR Maintenance: Lab – 106
- Case Management: Consumer Group Management - 21
- Registration / Admission / Program Assignment: Referrals Management - 90
- Exchange client Information with Providers – 109

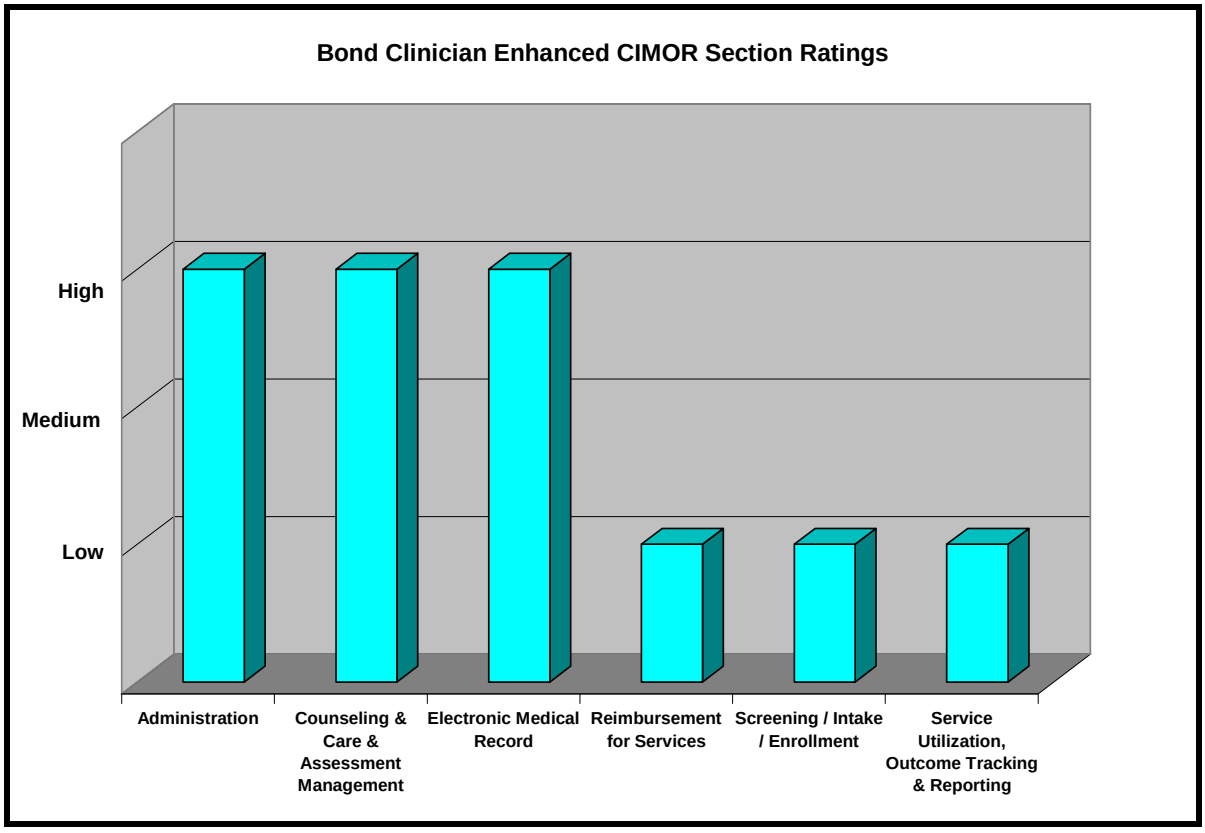

Figure 14. Bond Clinician Enhanced CIMOR Section Ratings

4.4.5 System Functional Weaknesses

Referring to both Table 9 and Figure 14 one may observe that Bond Clinician has several section weaknesses. These weaknesses are the following:

- Reimbursement for Services Low
- Screening / Intake / Enrollment Low
- Service Utilization, Outcome Tracking & Reporting Low

Because Bond Clinician is a comprehensive system, it already has many of the enhancements planned for CIMOR. However there are still a few enhancement functions that are missing from Clinician. These include the following:

- Medicare, Medicaid, and Private Insurance: BizTalk MEIS Interfaces – 69
- EOC Forensic Services – 102

On the surface the lack of so few functions seems contradictory c to the medium functional fit rating overall and the three low section ratings. The reason for these ratings is shown by the number of missing functions shown in Table 10.

The reader should note that while Bond Clinician is indeed comprehensive it was written to be generic so that it may be applicable to as many states as possible. Thus, the reader should not expect it to be a perfect match to the way DMH conducts its business. DMH should expect to make some adjustments to the way it conducts business so as to adapt to Bond Clinician.

4.4.6 Estimated Cost Range

The assumption is made that any new and/or enhanced system would become operational at 12:01 AM January 1. In this manner the annual operating costs are for a full year. Using this assumption and the preceding cost information the initial estimate for DMH to acquire, implement, and operate Bond Clinician is presented in Table 10.

The system purchase / lease price is estimated at $6,500,000. The large number of missing functions is shown to cost $8,000,000. The implementation and annual maintenance are each estimated to be $650,000.

The assumption is made that the contract for developing the missing functions, and the planned enhancements would be given to Bond Technologies since Clinician was developed by them. The reader should note that since Bond Technologies did develop Clinician, it is intimately familiar with all aspects of the system. Thus, no added burden (i.e., no additional implementation expense) would be incurred for installing the newly developed functions.

Table 10. Bond Clinician Estimated Costs

Line #	Annual Operating Cost Item	Cost
1.	**Missing function count**	38
2.	**System purchase / lease cost**	$6,500,000
3.	**Include Functions Currently in CIMOR**	$8,000,000
4.	**Implementation cost**	$650,000
5.	**Annual operating / maintenance cost**	$650,000
6.	**Include Functions Not Currently in CIMOR**	$922,000
7.	**Include Data Marts**	$876,000
8.	**Total first year costs (excluding enhancements)**	$15,800,000
9.	**Total first year costs (including Enhancements)**	$16,722,000
10.	**Total cost after first year**	$650,000

4.4.7 Conclusion

Bond Technologies has been around for more than a decade. During that time it has developed an impressive system. This sophisticated system is capable of performing many functions. Even though it is an excellent system with most of the planned CIMOR enhancements included, its rating is still medium when compared to the fully functional enhanced CIMOR. The reason for this is that many existing CIMOR functions are missing. These would need to be added.

Bond Technologies Clinician is developed using ASP.Net 2.0 Framework, which means the application has the ability to run on any recent Microsoft operating system with Microsoft Internet Explorer. Clinician uses Microsoft SQL as its database system. The system uses n-tiered architecture. [34]

While by no means the most expensive system examined, Bond Clinician is an expensive package when all enhancements and missing functionality are considered.

[34] Technology & Security, http://www.bondclinician.com/bc_features_technology_security.html.

4.5 Option 3 – EnCompass

4.5.1 Summary of Company Description

EnCompass is used in the following five Michigan counties: [35]

- Lenawee
- Livingston
- Monroe
- Saginaw
- Washtenaw

Mr. Jeremy Nelson was the Chief Information Architect at the WCHO and led the implementation of the EnCompass Electronic Health Record (EHR) for five counties in Southeast Michigan. [36] Mr. Nelson subsequently left WCHO and started Afia.

On October 1, 2007 Afia announced that the WCHO had selected Afia to provide IT Strategy and System Design services to its internal Information Management Department. Under the three-year contract, Afia will provide project management, training, and design services for the WCHO's EnCompass EMR system. [37]

In a telephone conversation with Mr. Nelson, he stated that PCE Systems, Inc. was the company which did the actual program development for EnCompass. According to Mr. Nelson PCE Systems has been around 17 years, and product is used by 5,000 people daily. Other than discovering that Peter Chang is the owner of PCE Systems, no other information could be found in the available time. [38]

4.5.2 Summary of Product Description

EnCompass is a web-based electronic health record system designed to Manage Mental Health, Developmental Disabilities, Substance Abuse and Physical Health Services for state and county Medicaid programs. EnCompass is comprised of interoperable modules which are designed to fit the workflow of Community Mental Health programs.[39]

SCCMHA believes that EnCompass is a database application integrating Managed Care Organization (MCO) and service provider related functions, giving to clinicians for the first time, the tool of a true electronic medical record (EMR). EnCompass also interfaces completely with general ledger software called Great Plains. According to SCCMHA their implementation was successful by any standard. Feedback from their provider network was highly positive as clinicians throughout the Saginaw mental health system realized the benefits of one secure and integrated EMR that can never be lost and is always instantly available. [40]

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35 What is Encompass?, http://about.ewcho.org/what.htm.
36 Afia - Management Profiles, http://afiahealth.com/management_profiles.html.
37 Afia Signs three year contract with the Washtenaw Community Health Organization, http://afiahealth.com/article_01090107.html.
38 2006 – 2007 Progress Report - New Encompass Software Implementation a Success, p. 3, http://www.sccmha.org/whats-new/SCCMHA_07_Prog%20Report.pdf.
39 What is Encompass?, http://about.ewcho.org/what.htm.
40 2006 – 2007 Progress Report - New Encompass Software Implementation a Success, p. 3, http://www.sccmha.org/whats-new/SCCMHA_07_Prog%20Report.pdf.

EnCompass can run reports on utilization, insurance, billing and caseloads. EnCompass also allows for customized reports.

EnCompass is fully HIPAA and 42 CFR compliant. EnCompass is supported by effective user documentation, face to face training and e-Learning courses built around the modules. The system is web-based and requires no special software or hardware. EnCompass operates in real-time and therefore allows immediate sharing of consumer information to authorized users. [41]

EnCompass has been used in Washtenaw County since October 2003. Encompass was created to serve the particular needs of the organization. [42]

4.5.3 Technical Platform Description

Mr. Jeremy Nelson in a telephone conversation stated that EnCompass was programmed with JAVA to run under Linux. He said the system is completely web based and hosted by PCE. He said that it was possible that some arrangement could be reached whereby ITSD could run the system. However this would have to be resolved during contract negotiations.

Mr. Nelson also stated that EnCompass uses a DB2 database but can export to an SQL database.

Mr. Nelson stated that there is essentially no hardcopy documentation for EnCompass. Rather all the documentation is built into the Help function. In this way the documentation will always stay current as system changes are made.

4.5.4 System Functional Strengths

As shown in Table 1 EnCompass has a high functionality fit with the enhanced CIMOR system. This is because Mr. Nelson completed the functionality matrix and provided cost information. Thus, the "missing" functions would be added prior to implementation. Thus, the EnCompass "fit" rating is based on a post implementation as opposed to a pre-implementation with certain enhancements.

Table 11. EnCompass Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	High
2.	Counseling & Care & Assessment Management	High
3.	Electronic Medical Record	High
4.	Reimbursement for Services	High
5.	Screening / Intake / Enrollment	High
6.	Service Utilization, Outcome Tracking & Reporting	High

The fit for each EnCompass section when compared to the enhanced CIMOR is shown in Table 11 and Figure 15.

From a functionality perspective EnCompass has every section rated high:

- Administration High
- Counseling & Care & Assessment Management High

[41] What is Encompass?, http://about.ewcho.org/what.htm.
[42] What is Encompass?, http://about.ewcho.org/what.htm.

- Electronic Medical Record High
- Reimbursement for Services High
- Screening / Intake / Enrollment High
- Service Utilization, Outcome Tracking & Reporting High

The reader should note that the cost information verbally obtained includes the footnoted EnCompass functions in the Functionality Comparison Matrix in the Appendix. Because EnCompass would be a comprehensive system after implementation, it already has most of the enhancements planned for CIMOR. These include the following:

- DMH Intra-agency Communication - 46
- EMR Maintenance: Physician Orders - 62
- Long Term Treatment, Discharge and Aftercare Planning - 63
- EMR Maintenance: Summary Views - 64
- EMR Maintenance: Crisis Action Plan View - 65
- EMR Maintenance: Discharge Plan - 66
- EMR Maintenance: Referral View - 67
- EMR Maintenance: Treatment Plan View – 68
- Registration / Admission / Program Assignment: Referrals Management – 90
- EMR Maintenance – 105
- Case Management: Consumer Group Management - 21
- Registration / Admission / Program Assignment: Referrals Management - 90
- Exchange client Information with Providers – 109.

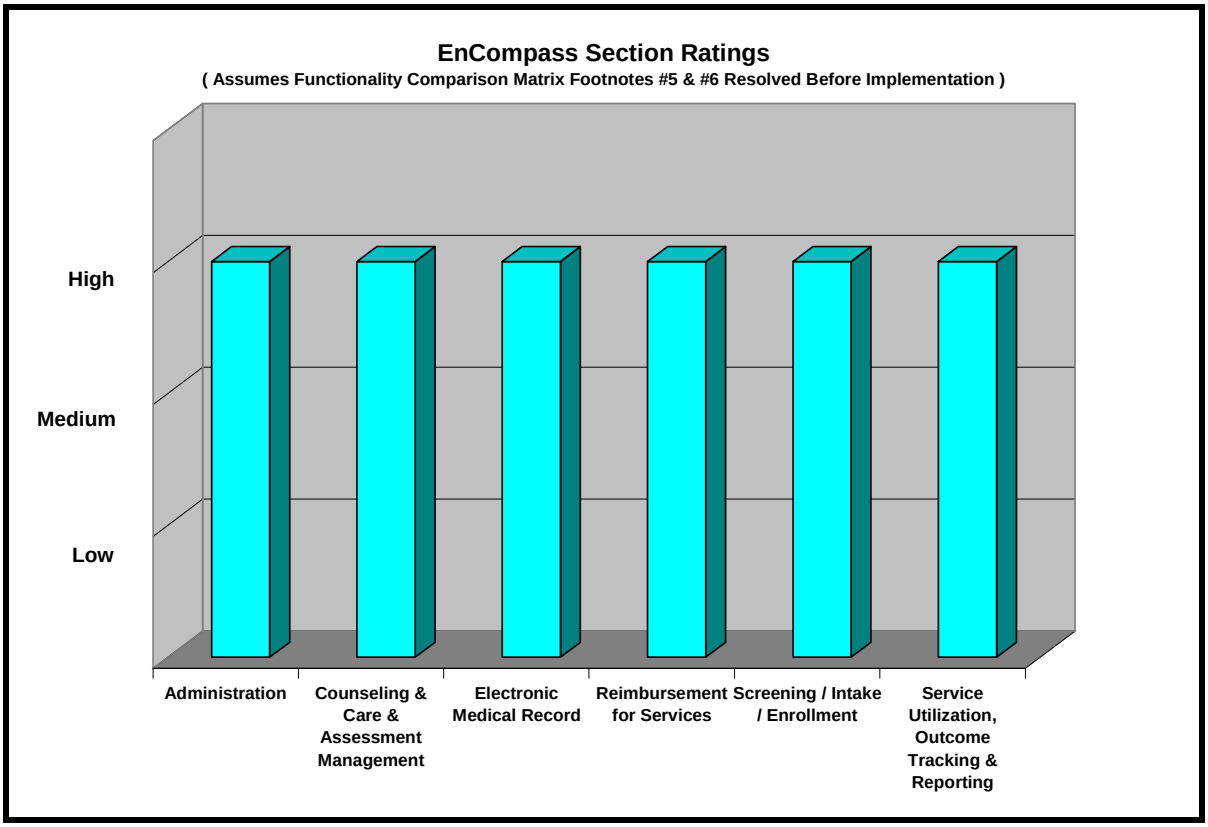

Figure 15. EnCompass Enhanced CIMOR Section Ratings

The Appendix contains the Functionality Comparison Matrix in which the reader may compare EnCompass to the other systems. In addition the individual function compatibilities (i.e., Yes / No value) may also be observed.

Because the only EnCompass documentation available is via the Help function, no description could be found for EnCompass functions. Regardless, EnCompass performs the functions listed in Table 12.

Table 12. EnCompass Functions / Modules[43]

Line #	EnCompass Function / Module
1.	Screening/Intakes
2.	Insurance Policies
3.	Emergency Notes/Pre-Admission Assessments
4.	Initial/Annual Assessments
5.	Appointments and Scheduling
6.	Provider Management– Providers, Contracts, Fee Schedules, Site Visits
7.	Court Orders/Alternative Treatment Orders
8.	Integrated SQL Server Reporting Services for customized and ad hoc reports
9.	Consumer Chart
10.	Admission/Transfer/Discharge Records
11.	Person Centered Treatment Plans
12.	Service Authorizations linked to Outcomes

[43] What is Encompass?, http://about.ewcho.org/what.htm.

Line #	EnCompass Function / Module
13.	Electronic Prescriptions
14.	Insurance Billing– 3rd party billing via EDI transactions
15.	Recipient Rights Compliant
16.	Discrete users, groups and functions to control access to all parts of the system
17.	Progress Notes (Individual and Group)
18.	Service Activity Logs
19.	Individual Consumer Budgets
20.	Caseloads and Census
21.	Med Review Notes/Psychiatric Reviews
22.	Call Tracking
23.	Interface with Medifax
24.	Electronic Signatures of all Clinical documents with Amendments

4.5.5 System Functional Weaknesses

Referring to both Table 11 and Figure 15 one may observe that EnCompass has no apparent sectional weaknesses.

Because EnCompass is a comprehensive system, it already has many of the enhancements planned for CIMOR. However there are still a few enhancement functions that are missing from EnCompass. These include the following:

- Medicare, Medicaid, and Private Insurance: BizTalk MEIS Interfaces – 69
- EOC Forensic Services – 102

The reader should note that while EnCompass is indeed comprehensive it was written for five Michigan counties. Thus, the reader should not expect it to be a perfect match to the way DMH conducts its business. DMH should expect to make some adjustments to the way it conducts business so as to adapt to EnCompass.

4.5.6 Estimated Cost Range

Because EnCompass was developed using public funds, there is no charge for system development (i.e., $0 in Table 13). However the system would have to be modified for DMH use. PCE System, which initially developed EnCompass, would be the agent making any and all system changes. PCE is thus intimately familiar with EnCompass. Because of this the charges for the enhancements in Appendix 2 CIMOR Functionality Matrix are not included in the system development charge.

SCCMHA stated that they converted 20,000 consumer demographic records, and the cost of their implementation was $553,512. The assumption is made that ratio analysis may be applied to SCCMHA to extend it to DMH.[44] Since DMH serves 150,000 consumers annually, [45] an approximate implementation cost may be computed using the MS Excel formula ROUND (($553,512 / 20,000) * 150,000, -4) where:

[44] 2006 – 2007 Progress Report - New Encompass Software Implementation a Success, p. 3, http://www.sccmha.org/whats-new/SCCMHA_07_Prog%20Report.pdf.
[45] About the Missouri Department of Mental Health, http://www.dmh.missouri.gov/about.htm.

- "$553,512" is the SCCMHA implementation cost
- "20,000" is the SCCMHA consumer count
- "150,000" is the DMH consumer count
- "-4" is the rounding factor in assumption 27 (i.e., $10,000)

Essentially this formula computes the cost of implementing a single consumer and then multiplying by the number of DMH clients annually. Thus, the implementation cost is estimated to be much higher than SCCMHA due to the much larger consumer count.

As observed in Table 13 EnCompass has the lowest missing function count of all the systems investigated.

The assumption is also made that the annual cost to operate / maintain this system is 10% of the implementation cost.

The assumption is made that any new and/or enhanced system would become operational at 12:01 AM January 1. In this manner the annual operating costs are for a full year. Using this assumption and the preceding cost information the initial estimate for DMH to acquire, implement, and operate EnCompass is presented in Table 13. In addition when Mr. Nelson discussed pricing he did so from the perspective of PCE System using Linux and hosting EnCompass.

Table 13. EnCompass Estimated Costs

Line #	Annual Operating Cost Item	Cost
a.	**Missing function count**	2
b.	**System purchase / lease cost**	$0
c.	**Include Functions Currently in CIMOR**	$0
d.	**Implementation cost**	$4,150,000
e.	**Annual operating / maintenance cost**	$420,000
f.	**Include Functions Not Currently in CIMOR**	$0
g.	**Include Data Marts**	$876,000
h.	**Total first year costs (excluding enhancements)**	$4,970,000
i.	**Total first year costs (including Enhancements)**	$4,970,000
j.	**Total cost after first year**	$420,000

The assumption is made that the contract for developing the missing as well as the planned enhancements would be given to PCE Systems since EnCompass was developed by them. The reader should note that since PCE Systems did develop EnCompass, it is intimately familiar with all aspects of the system. Thus, no added burden (i.e., no additional implementation expense) would be incurred for installing the newly developed functions.

4.5.7 Conclusion

The Encompass system implements integrated care to better serve vulnerable populations. Integrated care is focused on developing a beneficial partnership between mental health and primary care to address basic unmet healthcare needs of persons with serious mental illnesses. Integrated care results in lower cost to the public mental health care system. [46]

[46] What is Encompass?, http://about.ewcho.org/what.htm.

Five Michigan counties banded together to develop EnCompass to meet their mental healthcare needs and the way they do business. Because counties and states must be responsive to their own citizens, these five counties and Missouri DMH may well do things differently. This means that DMH will have to adapt to EnCompass unless they want to customize EnCompass, which somewhat defeats the purpose of obtaining an open source system.

EnCompass is a Linux, web based JAVA platform using DB2 as its database engine. This is not consistent with the Windows based platforms used by ITSD.

The technology fit for EnCompass as shown in Table 1 is low. The two principal reasons for this are Linux and DB2. At present DMH uses neither. The overall functional fit for EnCompass is high as seen in Table 1 One reason the fit being high is that Mr. Nelson stated that most of the missing functions could be developed prior to launch (i.e., implementation). Thus, they received a value of “Yes” even though currently they may not be fully developed.

4.6 Option 4 – MEDITECH

4.6.1 Summary of Company Description

MEDITECH was founded in 1969 with three people and one customer. Over the next 38 years the company has grown to 2,100 customers worldwide and over 2,600 employees. In 2006 software revenues totaled $344 million. Major markets include United States, Canada, United Kingdom and South Africa. MEDITECH claims to have a 5A1 Dun & Bradstreet credit rating, which is indeed impressive if true. Perhaps even more impressive is MEDITECH claims to have a 98% customer retention rate. [47]

MEDITECH is headquartered in Westwood, Massachusetts.

4.6.2 Summary of Product Description

MEDITECH's Health Care Information System (HCIS) is a suite of integrated software applications designed to support the delivery of patient care.

HCIS is comprehensive to say the least. A complete list of functions is presented in Appendix 6**Error! Reference source not found.**. When requesting MEDITECH to verify the system functionality matrix, MEDITECH proposed a set of applications that they thought would be applicable to the typical behavioral and mental health department. They of course did this with almost no information about DMH's needs. The information they had was a slightly modified version of the functionality matrix with all uniquely identifiable information removed. The applications MEDITECH suggested include the following:

- Behavioral Health Administrative
- Behavioral Health Clinicals
- Pharmacy
- General Accounting
- Human Resource Planning
- Scanning and Archiving
- Data Repository.

The Behavioral Health Administrative application manages both the quality and cost of care provided to behavioral health clients. The application provides a continuum of mental health care, ranging from emergency crisis intervention, acute and long-term care hospitalization, short-term episodic outpatient treatment services, and longer-term rehabilitative outpatient mental health services. Client information is integrated across departments and is always accurate and up-to-date to allow administrators immediate access to the administrative and financial statistics they need. [48]

The Behavioral Health Clinicals application provides care coordinators with functionality for caseload management, enrollments, waitlist management, treatment planning, and assessments to support comprehensive coordination of care across the enterprise. [49]

[47] MEDITECH at a Glance, http://www.meditech.com/AboutMeditech/pages/ataglance.htm.
[48] Product Information – Behavioral Health Administrative, http://www.meditech.com/ProductBriefs/pages/productpagebhadm.htm.
[49] Product Information – Behavioral Health Clinicals, http://www.meditech.com/ProductBriefs/pages/productpagebhclin.htm.

The Pharmacy application is tightly integrated with our Computerized Physician Order Entry (CPOE) and medication administration software to ensure patient safety. The product provides a comprehensive set of features for the safe administration of inpatient and outpatient medications and the efficient management of the organization's pharmacy. The integration allows staff to process all medications from a single, centralized process screen, throughout the enterprise. All the information and tools needed are at a user's fingertips. A Pharmacy Dispensing System interface and Formulary Service interface are included with the product. [50]

The General Accounting application is a complete set of financial management software that helps ensure the operational efficiency and accountability of the organization. The application software enables executives and managers to track trends and shifts in clinical, financial, and demographic activity. The system is designed for ease of use by including industry-standard access tools and custom report features. [51]

The Human Resource Planning application aids executives and employees in the areas of staff planning and recruitment, compensation, staff development, employee relations, benefits administration, and reporting. Designed to allow for automated and integrated workflow, Human Resource Planning provides Web-based processing and servicing capabilities and allows for timely and efficient information flow to executives. [52]

The Scanning and Archiving application solution enables the organization to move toward a paperless environment by electronically capturing and storing information normally collected via paper. This application provides an organization-wide solution to document scanning and imaging needs, enabling staff members to quickly scan documents into the system, review the quality of images, associate documents with patient records, and incorporate the resulting digital documents directly into users' workflow. The Scanning and Archiving product enables the organization to generate and maintain complete, secure, legal charts and allows for permanent storage of computer-generated reports and scanned documents. [53]

The Data Repository application provides the organization with an open environment for powerful reporting, along with decision support tools. By generating fast and easy reports through the Data Repository, users can report on clinical, administrative, and financial data. The integrity and consistency of the Data Repository database results from the tight integration inherent in HCIS. [54]

4.6.3 Technical Platform Description

MEDITECH has two basic systems: MAGIC and client/server. [55] MEDITECH uses the Microsoft Windows NT operating system and either Microsoft SQL Server or Oracle.

An interoperability or connectivity issue seems to be associated with MEDITECH software. Since MEDITECH developed and uses its own programming language (i.e., MAGIC), difficulties seem to be experienced when non-MEDITECH systems attempt to communicate with a

[50] Product Information – Pharmacy, http://www.meditech.com/ProductBriefs/pages/productpagepharm.htm.
[51] Product Information – General Accounting, http://www.meditech.com/ProductBriefs/pages/productpagega.htm.
[52] Product Information – Human Resource Planning, http://www.meditech.com/ProductBriefs/pages/productpagehr.htm.
[53] Product Information – Scanning and Archiving, http://www.meditech.com/ProductBriefs/pages/productpagescanarch.htm.
[54] Product Information – Data Repository, http://www.meditech.com/ProductBriefs/pages/productpagedr.htm.
[55] Client/Server - Scalable, Flexible, Network Configurations, http://www.meditech.com/PublicRelations/pages/technologyCSModels.htm.

MEDITECH application or database. Companies have even been formed to provide solutions to this seemly apparent connectivity issue. [56]

4.6.4 System Functional Strengths

As shown in Table 1 MEDITECH HCIS has a high functional fit with the enhanced CIMOR system. This is because the current MEDITECH system has 100% of the planned enhancements expected of the enhanced CIMOR. However, it is missing some of the functions in the current CIMOR.

Table 14. MEDITECH HCIS Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	High
2.	Counseling & Care & Assessment Management	High
3.	Electronic Medical Record	High
4.	Reimbursement for Services	High
5.	Screening / Intake / Enrollment	High
6.	Service Utilization, Outcome Tracking & Reporting	High

The fit for each MEDITECH section when compared to the enhanced CIMOR is shown in Table 14 and Figure 16.

From a functionality perspective MEDITECH HCIS has the following section strengths:

- Administration High
- Counseling & Care & Assessment Management High
- Electronic Medical Record High
- Reimbursement for Services High
- Screening / Intake / Enrollment High
- Service Utilization, Outcome Tracking & Reporting High

Because MEDITECH HCIS is a comprehensive system, it already has all of the enhancements planned for CIMOR.

[56] MEDITECH - Devgenics MEDITECH Infrastructure Services, http://www.devgenics.com/Portals/0/PDF/MeditechInfrastructureServices.pdf.

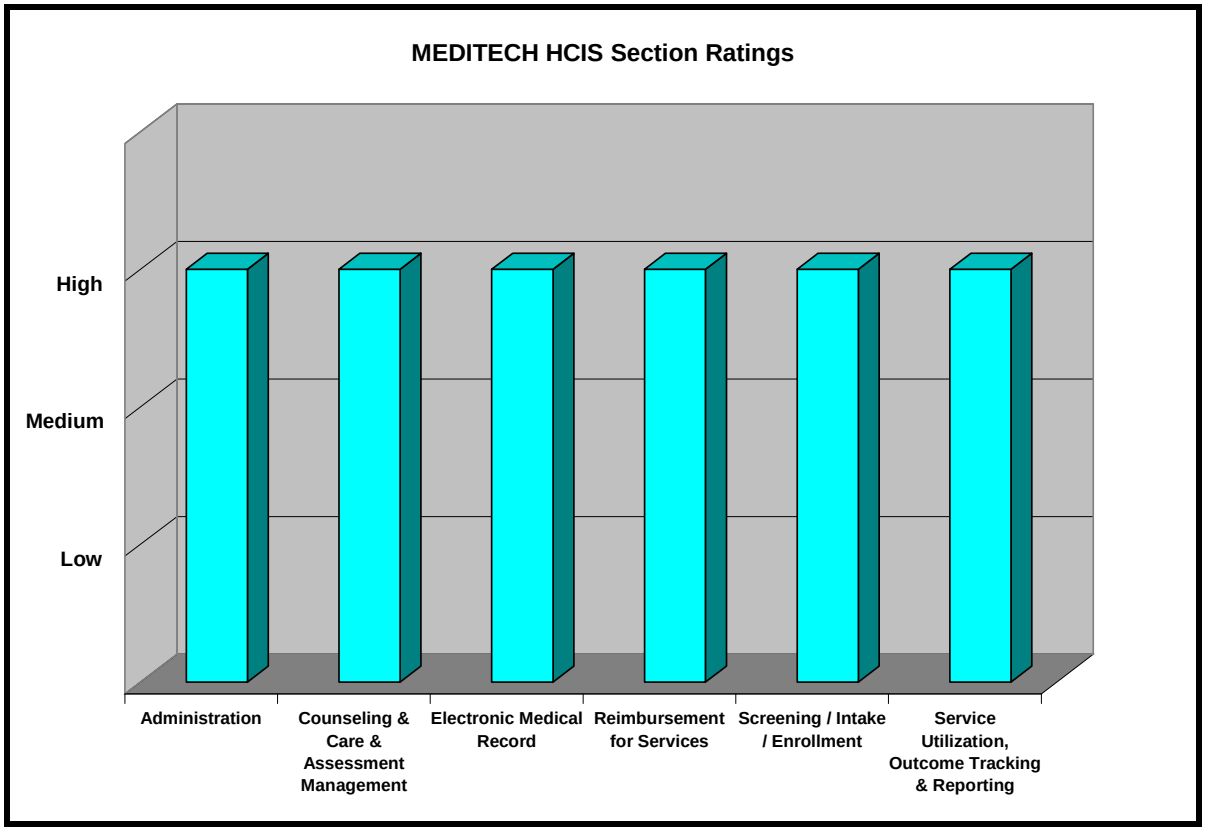

Figure 16. MEDITECH HCIS Enhanced CIMOR Section Ratings

The Appendix contains the Functionality Comparison Matrix in which the reader may compare MEDITECH HCIS to the other systems. In addition the individual function compatibilities (i.e., Yes / No value) may also be observed.

Appendix presents a list of the functions in MEDITECH Integrated HCIS. As may be observed MEDITECH Integrated HCIS is a robust, comprehensive system providing many useful functions.

4.6.5 System Functional Weaknesses

Referring to both Table 14 and Figure 16 one may observe that MEDITECH HCIS has no apparent section weaknesses. It appears to have all the planned CIMOR enhancements.

There are some existing CIMOR functions missing as shown in Table 15.

The reader should note that while MEDITECH is indeed comprehensive it was written to be generic so that it may be applicable to as many states as possible. Thus, the reader should not expect it to be a perfect match to the way DMH conducts its business. DMH should expect to make some adjustments to the way it conducts business so as to adapt to MEDITECH Integrated HCIS.

4.6.6 Estimated Cost Range

MEDITECH sells its product with a perpetual license. That is, DMH would never have to buy another copy of the system as long as it pays the maintenance fee. Moreover, as long as DMH paid the annual maintenance, it would receive all upgrades made to the system as part of the maintenance agreement.

The implementation cost is shown as $0 in Table 15 since MEDITECH includes installation in their system's purchase price.

The annual operating costs are for a full year. Using this assumption and the preceding cost information the initial estimate for DMH to acquire, implement, and operate MEDITECH Integrated HCIS is presented in Table 15.

Table 15. MEDITECH Integrated HCIS Estimated Costs

Line #	Annual Operating Cost Item	Cost
1.	**Missing function count**	13
2.	**System purchase / lease cost**	$6,500,000
3.	**Include Functions Currently in CIMOR**	$3,400,000
4.	**Implementation cost**	$0
5.	**Annual operating / maintenance cost**	$420,000
6.	**Include Functions Not Currently in CIMOR**	$615,000
7.	**Include Data Marts**	$876,000
8.	**Total first year costs (excluding enhancements)**	$10,320,000
9.	**Total first year costs (including Enhancements)**	$10,935,000
10.	**Total cost after first year**	$420,000

The assumption is made that the contract for developing all missing functions would be given to MEDITECH since the Integrated HCIS was developed by them. The reader should note that since MEDITECH did develop the product, it is intimately familiar with all aspects of the system. Thus, no added burden (i.e., no additional implementation expense) would be incurred for installing the newly developed functions.

The assumption has been made that none of the new systems would require additional hardware. However, the reader should note that MEDITECH specifically stated that the computer room hardware to support its software would be approximately $2.5 million.

4.6.7 Conclusion

MEDITECH has been around for almost four decades. It is a large company with impressive annual sales.

During the time that it has been in business, it has developed an extremely impressive system. This sophisticated, comprehensive system is capable of performing many functions as evident in Appendix 6. It is an excellent system with 100% of the planned CIMOR enhancements included. Its rating is high when compared to the fully functional enhanced CIMOR. However, there are a few missing existing CIMOR functions.

While by no means the most expensive system examined, MEDITECH Integrated HCIS is an expensive package when all enhancements are included. It becomes even more expensive if the $2.5 million in hardware must be acquired.

Currently ITSD is using the web based CIMOR on a Windows platform. Moving to the MEDITECH client/server platform could be considered a major step backward by some. Web based applications will continue to become more prevalent and most likely will replace most client/server applications. In addition MEDITECH developed HCIS using its own proprietary language. DMH would effectively be cutoff from the system since ITSD is not conversant with the language. Because of these reasons MEDITECH is rated low on technical architecture in Table 1.

4.7 Option 5 – VistA

4.7.1 Summary of Company Description[57]

The United States Department of Veterans Affairs (VA) is a government-run military veteran benefit system with Cabinet-level status. It is responsible for administering programs of veterans' benefits for veterans, their families, and survivors.

It was formerly called the Veterans Administration, also called the VA, which was established July 21, 1930, to consolidate and coordinate government activities affecting war veterans. On October 25, 1988, President Reagan signed legislation creating a new federal Cabinet-level Department of Veterans Affairs to replace the Veterans Administration effective March 15, 1989.

It is a single-payer government run health care system. With a budget of more than $70 billion, VA employs approximately 230,000 people at hundreds of VA medical centers, clinics and benefits offices.

The Department has three main subdivisions, known as Administrations:

- Veterans Health Administration
- Veterans Benefits Administration
- National Cemetery Administration.

The Veterans Health Administration is responsible for providing health care in all its forms. It also conducts medical research. It has primary responsibility for VistA.

4.7.2 Summary of Product Description[58]

The VA has had automated information systems in its medical facilities since 1985, beginning with the Decentralized Hospital Computer Program (DHCP) information system, including extensive clinical and administrative capabilities. The Veterans Health Information Systems and Technology Architecture (VistA), supporting ambulatory and inpatient care, delivered significant enhancements to the original system with the release of the Computerized Patient Record System (CPRS) for clinicians in 1997. CPRS provides a single interface for health care providers to review and update a patient's medical record and to place orders, including medications, special procedures, x-rays, patient care nursing orders, diets, and laboratory tests. CPRS is flexible enough to be implemented in a wide variety of settings for a broad spectrum of health care workers and provides a consistent, event driven, Windows-style interface.

[57] United States Department of Veterans Affairs, http://en.wikipedia.org/wiki/United_States_Department_of_Veterans_Affairs.
[58] VistA Monograph 2006-2006, p.6, http://www.va.gov/vista_monograph/docs/vista_monograph2005_06.pdf.

CPRS organizes and presents all relevant data on a patient in a way that directly supports clinical decision-making. The comprehensive cover sheet (refer to Figure 17) displays timely, patient-centric information, including active problems, allergies, current medications, recent laboratory results, vital signs, hospitalization, and outpatient clinic history. This information is displayed immediately when a patient is selected and provides an accurate overview of the patient's current status before clinical interventions are ordered. CPRS capabilities include:

- A Real-Time Order Checking System that alerts clinicians during the ordering session that a possible problem could exist if the order is processed;
- A Notification System that immediately alerts clinicians about clinically significant events;
- A Patient Posting System, displayed on every CPRS screen that alerts clinicians to issues related specifically to the patient, including crisis notes, warning, adverse reactions, and advance directives;
- The Clinical Reminder System that allows caregivers to track and improve preventive health care for patients and ensure timely clinical interventions are initiated;
- Remote Data View functionality that allows clinicians to view a patient's medical history from other VA facilities to ensure the clinician has access to all clinically relevant data available at VA facilities.

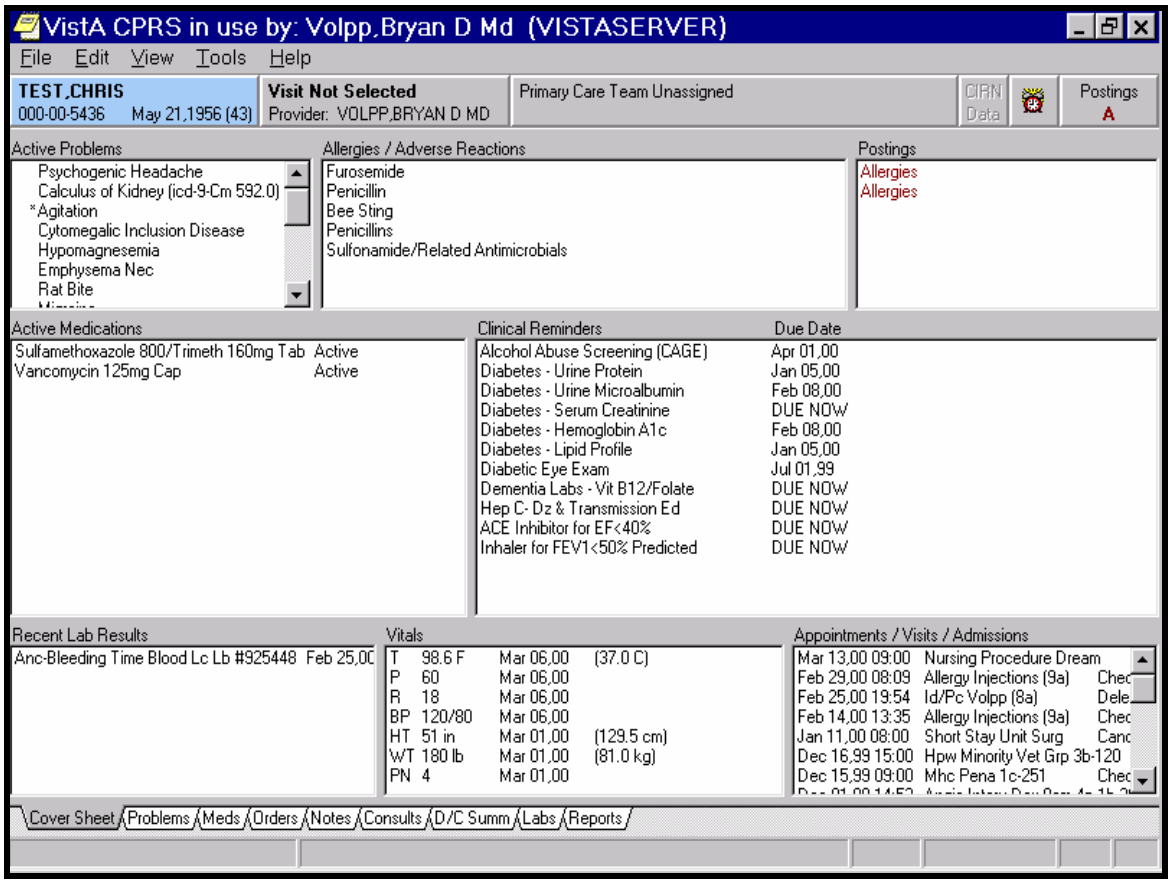

Figure 17. VistA Cover Sheet Screen

(http://www.ihs.gov/generalweb/webcomponents/documents/isac/5105-200309231505247.ppt)

VistA Imaging is also operational at most VA Medical Centers. VistA Imaging provides a multimedia, online patient record that integrates traditional medical chart information with medical images, including X-rays, pathology slides, video views, scanned documents, cardiology exam results, wound photos, dental images, endoscopies, etc. into the patient record.

Bar Code Medication Administration addresses the serious issue of inpatient medication errors by electronically validating and documenting medications for inpatients. It ensures that the patient receives the correct medication in the correct dose, at the correct time, and visually alerts staff when the proper parameters are not met.

HealtheVet Desktop is an application framework that will host the new generation of Veterans Health Administration (VHA) clinical applications. Care Management is the first application to run on the new HealtheVet Desktop and is an enhancement of CPRS designed to assist health care providers to follow-up on clinical interventions that might otherwise be missed. Care Management provides an automated method for tracking follow-up actions/tasks for a panel of patients for a designated period of time. The four perspectives of Care management are the Clinician Dashboard, the Nursing Dashboard, the Query Tool and the Sign List.

Of the numerous flavors of VistA (at least seven[59]), the Certification Commission for Healthcare Information Technology (CCHIT) confirms that WorldVistA EHR VOE/ 1.0 from WorldVistA (http://www.worldvista.org/) is a CCHIT Certified Ambulatory EHR product for 2006. [60]

The VistA software developed by the VA is available through e-FOIA at ftp://ftp.va.gov/VistA.

4.7.3 Technical Platform Description[61]

VISTA is built on a client/server architecture, which ties together workstations and personal computers with graphical user interfaces at Veterans Health Administration (VHA) facilities, as well as software developed by local medical facility staff. VISTA also includes the links that allow commercial off-the-shelf software and products to be used with existing and future technologies. The Decision Support System (DSS) and other national databases that might be derived from locally generated data lie outside the scope of VISTA. [62] VistA also has the capabilities to take advantage of Internet technologies.[63]

VistA is built upon a core of ANS MUMPS. Platforms currently in use include the following (where "IA" abbreviates "Intel Architecture"): [64]

- IA32/IA64 with Linux & InterSystems Cache
- IA32/IA64 with Windows OS & InterSystems Cache
- Alpha/Itanium with OpenVMS & InterSystems Cache.

Ninety-five percent (95%) of all VistA systems in the VA run on Alpha/VMS/Cache.

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59 Accenture - Federal Health IT: Focus on VistA, p. 29, http://www.vistasoftware.org/why/wppdfs/VistA%20Federal%20Health%20Focus%20080505.pdf.
60 CCHIT - WorldVistA EHR VOE/ 1.0, http://www.cchit.org/choose/ambulatory/2006/WorldVistA-EHR.asp.
61 VistA - U.S. Department of Veterans Affairs national-scale HIS, p. 5, http://www1.va.gov/cprsdemo/docs/VistA_Int_Jrnl_Article.pdf.
62 Veterans Health Information Systems and Technology Architecture (VISTA), http://www.va.gov/VISTA_MONOGRAPH/index.asp.
63 Veterans Health Information Systems and Technology Architecture (VISTA), http://www.va.gov/VISTA_MONOGRAPH/index.asp.
64 Accenture - Federal Health IT: Focus on VistA, p. 39, http://www.vistasoftware.org/why/wppdfs/VistA%20Federal%20Health%20Focus%20080505.pdf.

VistA has three key infrastructure components: kernel, FileMan, and MailMan.

The kernel provides shared services for VistA applications, system management tools, and a portability layer between the underlying operating system and application code. Mail-Man is a general purpose messaging system that transmits messages such as email and alerts, computer programs, data dictionaries, and data. Senders and recipients can be users or programs within a single facility or anywhere within VHA. FileMan is VistA's database management system, which provides platform-independent database services. Oracle[65] is one of the database engines that VistA can use.

Programming languages used for new development must utilize objects, or components to be cost effective and promote code reuse. Programming languages in use today include the following: [66]

- M – staple of VHA – 22 years of business logic, interfaces
- SQL – industry standard
- Java – platform independent application design
- .NET family of languages – Visual Basic, C#, ASP.NET (which provides Web enabled technology).

M provides language mechanism to shield against changes in host OS's. [67]

VistA in the future will have the following characteristics: [68]

- Oracle based or at least SQL
- EHR – data to be stored regionally or centrally in massive databases, accessed locally
- Web based GUI written in Java
- Replacement of the M DB engine
- Recoding of 25 years of VistA application code written in M into Java.

[65] Accenture - Federal Health IT: Focus on VistA, p. 40, http://www.vistasoftware.org/why/wppdfs/VistA%20Federal%20Health%20Focus%20080505.pdf.
[66] VistA Veterans Health Information System and Technology Architecture, p. 19, http://www.vistasoftware.org/presentations/VistAIntroduction_080406.pdf.
[67] VistA Veterans Health Information System and Technology Architecture, p. 37, http://www.vistasoftware.org/presentations/VistAIntroduction_080406.pdf.
[68] VistA Veterans Health Information System and Technology Architecture, p. 40, http://www.vistasoftware.org/presentations/VistAIntroduction_080406.pdf.

4.7.4 System Functional Strengths

As shown in Table 1, VistA has a medium functional fit with the enhanced CIMOR system. This is because the current VistA does not have all the functionality expected of the enhanced CIMOR.

The fit for each VistA section when compared to the enhanced CIMOR is shown in Table 16 and Figure 18.

Table 16. VistA Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	Medium
2.	Counseling & Care & Assessment Management	Medium
3.	Electronic Medical Record	High
4.	Reimbursement for Services	Low
5.	Screening / Intake / Enrollment	Low
6.	Service Utilization, Outcome Tracking & Reporting	Medium

The reader should note that VistA functions only within the VA organizations. Thus, to reach providers outside DMH, one may have to modify some VistA modules. The scope of this situation is unknown and could result in modifying the fit rating. The VistA functions that likely have interfaces to other applications requiring modification are denoted in VistA footnote 4 in the Functionality Comparison Matrix. Thus, both Table 16 and Figure 18 assume these issues have been resolved prior to implementation.

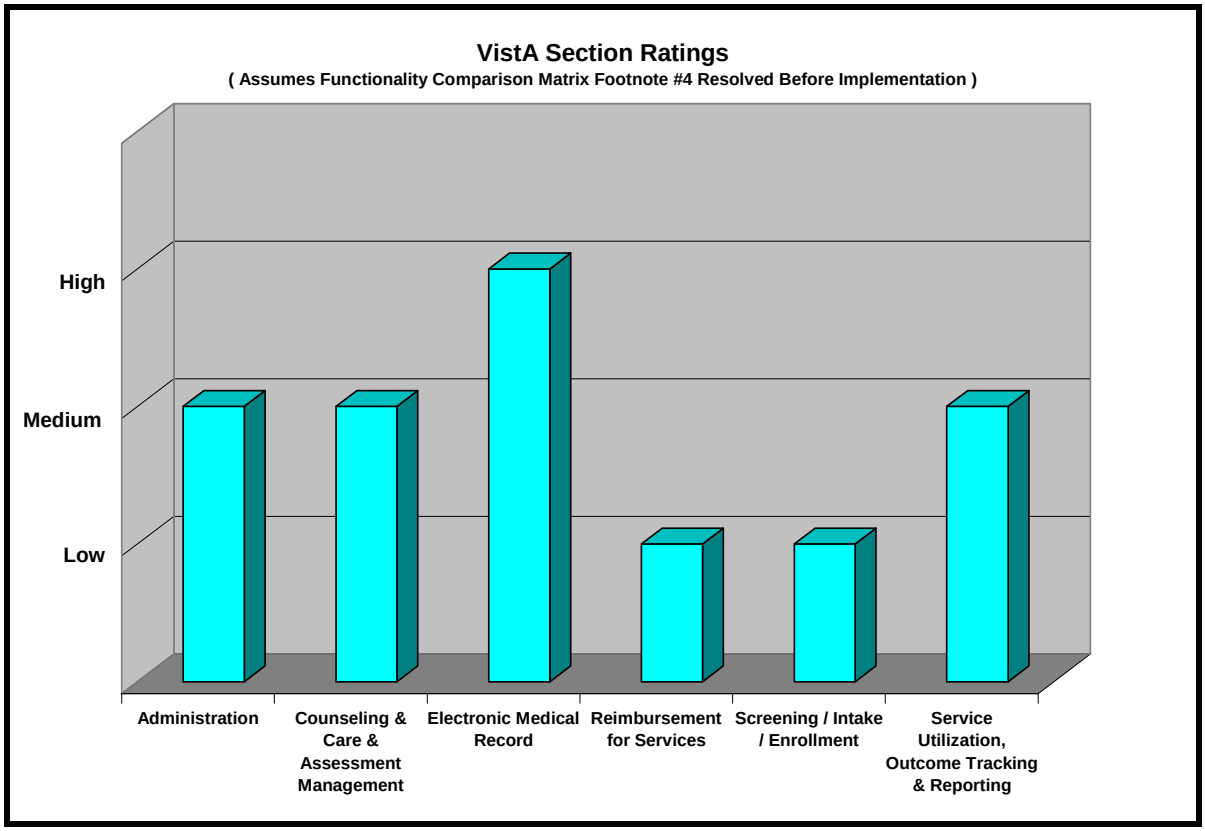

Figure 18. VistA Enhanced CIMOR Section Ratings

From a functionality perspective VistA has the following section strengths:

- Electronic Medical Record High
- Administration Medium
- Counseling & Care & Assessment Management Medium
- Service Utilization, Outcome Tracking & Reporting Medium.

Because VistA is a comprehensive system, it already has some of the enhancements planned for CIMOR. These include the following:

- DMH Intra-agency Communication - 46
- EMR Maintenance: Physician Orders - 62
- Long Term Treatment, Discharge and Aftercare Planning - 63
- EMR Maintenance: Summary Views - 64
- EMR Maintenance: Crisis Action Plan View - 65
- EMR Maintenance: Discharge Plan - 66
- EMR Maintenance: Referral View - 67
- EMR Maintenance: Treatment Plan View – 68
- EMR Maintenance - 105
- EMR Maintenance: Lab – 106
- Case Management: Consumer Group Management – 21.

The Appendix contains the Functionality Comparison Matrix in which the reader may compare VistA to the other systems. In addition the individual function compatibilities (i.e., Yes / No value) may also be observed.

VistA has the functionality shown in Table 17. No attempt has been made to provide descriptions for the numerous VistA applications: they are voluminous. To discover what each application does, refer to the documentation associated with each application. This documentation may be found at http://www.va.gov/vdl/ following the links accordingly.

Table 17. VistA Functionality[69]

Line #	Section	Application
1.	**Clinical[70]**	Admission Discharge Transfer (ADT)
2.		Ambulatory Care Reporting
3.		Beneficiary Travel
4.		Blind Rehabilitation
5.		Care Management
6.		Clinical Case Registries
7.		Clinical Procedures
8.		Clinical/Health Data Repository (CHDR)
9.		Computerized Patient Record System (CPRS)
10.		CPRS: Adverse Reaction Tracking (ART)
11.		CPRS: Authorization Subscription Utility (ASU)
12.		CPRS: Clinical Reminders
13.		CPRS: Consult/Request Tracking
14.		CPRS: Health Summary
15.		CPRS: Problem List
16.		CPRS: Text Integration Utility (TIU)
17.		Dentistry
18.		Electronic Wait List
19.		Functional Independence Measurement (FIM)
20.		Group Notes
21.		HDR – Historical (HDR-Hx)
22.		Home Based Primary Care (HBPC)
23.		Home Telehealth
24.		Immunology Case Registry (ICR)
25.		Incomplete Records Tracking (IRT)
26.		Intake and Output
27.		Lab: Anatomic Pathology
28.		Lab: Blood Bank
29.		Lab: Blood Bank Workarounds
30.		Lab: Electronic Data Interchange (LEDI)
31.		Lab: Emerging Pathogens Initiative
32.		Lab: National Laboratory Tests/ LOINC Request Form
33.		Lab: Point of Care (POC)

[69] VHA Software Document Library, http://www.va.gov/vdl/.
[70] VHA Software Document Library – Clinical Section, http://www.va.gov/vdl/section.asp?secid=1.

Line #	Section	Application
34.		Lab: Universal Interface
35.		Laboratory
36.		Lexicon Utility
37.		Medicine
38.		Mental Health
39.		Nursing
40.		Nutrition and Food Service (NFS)
41.		Oncology
42.		Patient Appointment Info. Transmission (PAIT)
43.		Patient Care Encounter (PCE)
44.		Patient Record Flags
45.		Pharm: Automatic Replenish / Ward Stock (AR/WS)
46.		Pharm: Bar Code Medication Administration (BCMA)
47.		Pharm: Benefits Management (PBM)
48.		Pharm: Consolidated Mail Outpatient Pharmacy
49.		Pharm: Controlled Substances
50.		Pharm: Data Management (PDM)
51.		Pharm: Drug Accountability
52.		Pharm: Inpatient Medications
53.		Pharm: National Drug File (NDF)
54.		Pharm: Outpatient Pharmacy
55.		Pharm: Prescription Practices (PPP)
56.		Primary Care Management Module (PCMM)
57.		Prosthetics
58.		Quality Audiology Speech Anal Rpting (QUASAR)
59.		Radiology / Nuclear Medicine
60.		RAI/MDS
61.		Remote Order Entry System (ROES)
62.		Scheduling
63.		Social Work
64.		Spinal Cord Dysfunction
65.		Surgery
66.		VistA Imaging System
67.		VistAWeb
68.		Visual Impairment Service Team (VIST)
69.		Vitals / Measurements
70.		Womens Health
71.	**Financial-Administrative Section**[71]	Accounts Receivable (AR)
72.		Auto Safety Incident Surv Track System (ASISTS)
73.		Automated Information Collection System (AICS)
74.		Automated Medical Information Exchange (AMIE)
75.		Clinical Monitoring System
76.		Compensation Pension Records Interchange (CAPRI)

[71] VHA Software Document Library – Financial-Administrative Section, http://www.va.gov/vdl/section.asp?secid=3.

Line #	Section	Application
77.		Current Procedural Terminology (CPT)
78.		Decision Support System (DSS) Extracts
79.		Diagnostic Related Group (DRG) Grouper
80.		Electronic Claims Management Engine (ECME)
81.		Engineering (AEMS / MERS)
82.		Enrollment Application System
83.		Equipment / Turn-In Request
84.		Event Capture
85.		Fee Basis
86.		Fugitive Felon Program (FFP)
87.		Generic Code Sheet (GCS)
88.		Health Eligibility Center (HEC)
89.		Hospital Inquiry (HINQ)
90.		ICD-9-CM
91.		IFCAP
92.		Incident Reporting
93.		Income Verification Match (IVM)
94.		Integrated Billing (IB)
95.		Integrated Patient Funds
96.		Library
97.		Occurrence Screen
98.		Patient Representative
99.		Personnel and Accounting Integrated Data (PAID)
100.		Police and Security
101.		Quality Management Integration Module
102.		Record Tracking
103.		Release of Information (ROI) Manager
104.		Veterans Identification Card (VIC/PICS)
105.		Voluntary Service System (VSS)

4.7.5 System Functional Weaknesses

Referring to both Table 16 and Figure 18 one may observe that VistA has several section weaknesses. These weaknesses are the following:

- Reimbursement for Services Low
- Screening / Intake / Enrollment Low.

Because VistA is a comprehensive system, it already has many of the enhancements planned for CIMOR. However there are still a few enhancement functions that are missing from VistA. These include the following:

- Medicare, Medicaid, and Private Insurance: BizTalk MEIS Interfaces - 69
- Registration / Admission / Program Assignment: Referrals Management - 90
- EOC Forensic Services – 102

- Registration / Admission / Program Assignment: Referrals Management - 90
- Exchange client Information with Providers – 109.

The reader should note that while VistA is indeed comprehensive it was written for the VA. Thus, the reader should not expect it to be a perfect match to the way DMH conducts its business. DMH should expect to make some adjustments to the way it conducts business so as to adapt to VistA.

4.7.6 Estimated Cost Range

VistA is an Open Source application since it was developed with public funds. Thus, the acquisition cost is $0 as shown in Table 18.

The number of missing existing CIMOR functions is shown in Table 18. To compute the "$9,000,000" use ($200,000/missing function) X (45 missing functions).

According to the VA, the cost of maintaining the system is $80 per patient per.[72] DMH serves 150,000 consumers annually.[73] Thus the DMH cost to maintain VistA is estimated by using the MS Excel formula ROUND (150,000*80,-4), which yields $12,000,000.

The initial estimate for DMH to acquire, implement, and operate VistA is presented in Table 18.

Table 18. VistA Estimated Costs

Line #	Annual Operating Cost Item	Cost
1.	**Missing function count**	39
2.	**System purchase / lease cost**	$0
3.	**Include Functions Currently in CIMOR**	$7,800,000
4.	**Implementation cost**	$6,930,000
5.	**Annual operating / maintenance cost**	$12,000,000
6.	**Include Functions Not Currently in CIMOR**	$1,025,000
7.	**Include Data Marts**	$876,000
8.	**Total first year costs (excluding enhancements)**	$26,730,000
9.	**Total first year costs (including Enhancements)**	$27,755,000
10.	**Total cost after first year**	$12,000,000

The assumption has been made that since the VistA system would be acquired from the VA that no one on the ITSD staff or any contractor retained would be familiar with VistA and its M language. Thus, the reason for the implementation cost of $6,930,000 added to the original development cost because these enhancements will / may complicate the implementation.

The reader should also note that while researching VistA several sources were found that presented lengthy implementation periods for VistA. Midland Memorial Hospital in Midland, Texas spent about 20 months (January 2005 – August 2006) implementing Med sphere Systems' OpenVista, which is a Linux-based EHR platform with roots in the Open Source VistA system.[74] VistA CPRS preparation at VA Medical Center in Nashville, Tennessee unfolded

[72] Public and Intergovernmental Affairs – VA Receives 2006 Innovations in Government Award, http://www1.va.gov/opa/pressrel/pressrelease.cfm?id=1152.
[73] About the Missouri Department of Mental Health, http://www.dmh.missouri.gov/about.htm.
[74] OpenVista at Midland Memorial Hospital, http://opensource.sys-con.com/read/284251.htm.

over 30 months.[75] These may well be atypical implementation times for VistA. If DMH seriously considers VistA a candidate for implementation, additional information should be sought.

4.7.7 Conclusion

The VistA system implements integrated care to better serve thousands of veterans. VistA has been refined over many years to a most sophisticated and comprehensive system.

Several versions of VistA are available running on different platforms. Currently VistA is primarily an M (i.e., MUMPS) programmed system that will evolve into a JAVA system. VistA can run on Windows, Linux, and UNIX platforms. For the most part FileMan is the current database system. However, numerous "hooks" are available for COTS linking to VistA.

Even though VistA is Open Source and therefore "free," the cost of the "free" package makes it by far the most expensive system to implement and maintain of those investigated. Even if the $80/patient per year maintenance change does not apply to DMH, a $10/patient per year cost would result in an annual maintenance charge of $1,500,000, which is still the most expensive. If the per patient charge could be reduced to $3/patient, then the annual DMH cost would be $450,000, which is inline with the other packages. But a $3/patient charge is a reduction of roughly 96% from the $80.

The technology fit for VistA as shown in Table 1 is low. The two principal reasons for this are the M programming language and the FileMan database management module. At present DMH uses neither. The overall functionality fit for VistA is medium as seen in Table 1 One reason the medium fit is that some functions would possibly have to be modified to allow external providers access to the system. Of course ITSD would also have to implement the numerous missing functions prior to implementation.

[75] VistA*/U.S. Department of Veterans Affairs national-scale HIS, p. 7, http://www1.va.gov/cprsdemo/docs/VistA_Int_Jrnl_Article.pdf.

4.8 Option 6 – WITS

4.8.1 Summary of Company Description

The core Web Infrastructure for Treatment Services (WITS) software was originally developed in a partnership with WESTAT through a Federal Contract from the Center for Substance Abuse Treatment (CSAT), with the intent of facilitating collaboration among states and building a reusable, publicly-owned, web-based application to collect substance abuse data. [76]

Seven states[77] and four counties using WITS came together in April 2006 to form the WITS Collaborative. The eleven states and counties are: [78]

- 7 states - Iowa, Alaska, Hawaii, Maryland, Illinois-ATR, Tennessee-ATR, Wyoming-ATR
- 4 counties - Salt Lake-UT, San Diego-CA, Mendocino-CA, Sonoma-CA, Marin-CA.

The company that now does development for WITS is FEI.com. Headquartered in Columbia, MD FEI.com is an information technology company known for rapid system development and implementation. Closely connected with major universities, research institutes, and government agencies, FEI.com will quickly meet organizational needs in a wide range of project areas such as web-based decision support systems (DSS), web-based survey/data collection systems, medical research and clinical lab information systems, geographic information systems (GIS), database, data mining, knowledge-base, and expert systems. Their clients include the Center for Substance Abuse Treatment, Maryland Department of Health and Mental Hygiene, Illinois Department of Human Services, John Hopkins University, Case Western Reserve, Accenture, Sony Pictures, Northrop Grumman, and Fannie Mae. [79]

Since its founding in 1999, FEI.com has grown steadily in the Federal and State government IT services business. FEI.com had annual revenues exceeding $8 million in 2004. The company has over 50 employees comprised of project managers, business analysts, system architects, system designers, and programmers. The company's expertise covers web applications design, data repository implementation, workflow automations for clinical and research management information systems, business process re-engineering, asset management, disaster recovery, etc. [80]

FEI.com's IT infrastructure consists of more than 30 high end servers located at various facilities including FEI.com offices. All are connected to the Internet 7 days a week, 24 hours a day with a 100% up-time guaranteed MCI T1 line protected with a firewall network security system. FEI.com database servers, web servers, and application servers provide clients with a variety of online services. Through the infrastructure, FEI.com is currently hosting substance abuse treatment production systems for Illinois, Iowa, and Salt Lake County in Utah as well as conducting major IT development and implementation work for SAIS, WITS, ATR, and other SAMHSA projects.

FEI.com initially provided the programming and technology expertise behind the WITS system. Subsequently, over the last 3 years FEI.com has progressively strengthened its expertise in

[76] Utah Web Infrastructure for Treatment Services, p. 2, http://www.nasadad.org/resource.php?base_id=899.
[77] WITS California Homepage claims that 11 states are using WITS but does not name them, http://california.witsweb.org/.
[78] Utah Web Infrastructure for Treatment Services, p. 2, http://www.nasadad.org/resource.php?base_id=899.
[79] Welcome to FEI.com, http://www.feinfo.com/home.asp.
[80] FEI.com About Us, http://www.feinfo.com/aboutus.asp.

Substance Abuse, Behavioral Health, and Mental Health from a business perspective. The company believes that the success and rapid growth of WITS is largely attributable to its Subject Matter Experts' involvement in all phases of development and deployment. FEI.com has on-staff Substance Abuse and Mental Health Counselors, an onsite HIPAA expert, direct access to FEI.com Partners' considerable clinical and research experience, several partnerships with State and County Medicaid gurus, medical billing consultants, former State Directors of Substance Abuse, and alliances with local consultants capable of onsite training and support within the various WITS implementations. [81]

4.8.2 Summary of Product Description

WITS is a set of modular IT components that states can use as building blocks to construct web-based administrative data systems that meet current and emerging Substance Abuse and Mental Health Services Administration reporting requirements, such as TEDS, GPRA, and NOMMS. WITS is a flexible, HIPAA and 42-CFR part II compliant system that allows states and their individual agencies, or groups of agencies, to tailor their implementation to meet specific needs. [82]

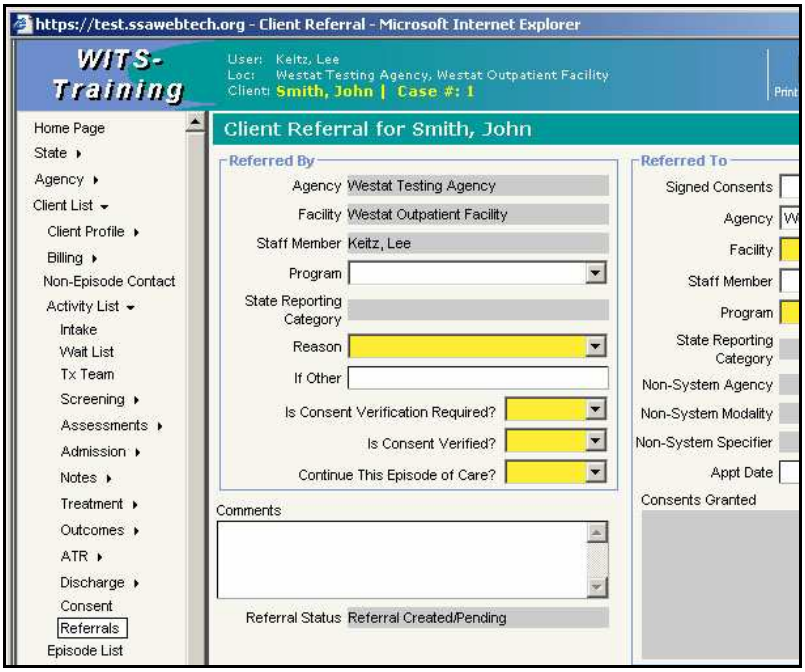

Figure 19. Part of WITS Client Referral Screen

WITS is currently used by states to manage clients, providers, funding, and outcome reporting. WITS has also been deployed to clinics and providers where the system functions as a useful tool for providers and integrates with their daily clinical processes. WITS enables thousands of clinicians working for hundreds of providers to assess patients, administer facilities, manage waiting lists, and to collect outcome measurement data in real-time via a secure, web-based framework. [83]

The WITS Application provides the State and its Providers and Clinicians with: [84]

- A secure system with confidentiality and privacy
- One central location for updating and achieving State reporting requirements
- A central data repository for monitoring and managing clinical data
- A system for States to manage Provider and Practitioner registrations and certifications, as well as fulfill reporting obligations to federal government programs.

81 FEI.com Services, http://www.feinfo.com/services.asp.
82 FEI.com Projects, http://www.feinfo.com/projects.asp#wits.
83 FEI.com Projects, http://www.feinfo.com/projects.asp#wits.
84 WITS Basics, http://www.witsweb.org/basics_intro.asp.

FEI continues to build upon the WITS foundation to provide additional capabilities for states and counties. Most recently, FEI has partnered with Illinois and Wyoming to provide a WITS-based ATR (Access To Recovery) solution to manage the complete administration and deployment of their ATR program within their respective states. [85]

Each member of the WITS Collaborative is able to use existing tools and, in turn, contribute tools that they have developed for their own use. WITS Collaborative Efforts include the following: [86]

- Salt Lake County is adding the Billing/Payer System with Hawaii
- Group Notes with all collaborative members
- A Reporting tool which was developed by Tennessee is available
- Youth assessment tool (GAIN) is being developed
- E-Court tool is being developed by Maryland
- SOMMS requirements are in development by Hawaii, Salt Lake County and Iowa
- Drug Screening Management is being developed by Sonoma County, CA.

4.8.3 Technical Platform Description [87]

WITS is built with Microsoft's C# .NET framework using a SQL Server database. All system configuration and data exchange is handled using XML files.

FEI.com uses a non-captive business model where States and Counties that implement WITS are given the source code. Additionally, FEI.com offers training to the acquiring organization's programmers for maintaining and enhancing the code internally.

Most customers choose to have FEI.com host their WITS instance. This allows for maximum data security and the fastest possible deployment of updates and enhancements. FEI Virtual Hosting includes the items shown in Table 19.

85 FEI.com Projects, http://www.feinfo.com/projects.asp#wits.
86 Utah Web Infrastructure for Treatment Services, p. 6, http://www.nasadad.org/resource.php?base_id=899.
87 Web Infrastructure for Treatment Services (WITS) - Technology, http://california.witsweb.org/technology.asp.

Table 19. FEI Virtual Hosting

Line #	System Area	Details	
1.	Hosting Services	Equinox Facility	Monitoring, backups, redundant power supplies and backup generators, remote administration, and bandwidth
2.	Hardware	Primary Database Server w/ADAM	Dell PowerEdge 6650, Dual Intel Xeon CPU or equivalent
3.		Backup Server	Dell PowerEdge 6650, Dual Intel Xeon CPU or equivalent
4.		Web Server	Dell PowerEdge 2850, Dual Intel Xeon CPU or equivalent
5.	Software Licenses	Operating System	4 dual processor Windows 2003 Advanced Server Licenses
6.		SQL Server License	2 processor license for Database Server
7.		SQL Server License	2 processor license for Backup Server
8.	Network Hardware	Firewall	
9.		Managed Switch	

4.8.4 System Functional Strengths

As shown in Table 1 WITS has a medium functionality fit with the enhanced CIMOR system. This is because four of the six sections are rated low. Thus, numerous "missing" functions would have to be added prior to implementation.

Table 20. WITS Enhanced CIMOR Section Ratings

Line #	Enhanced CIMOR Section Category	Rating
1.	Administration	Low
2.	Counseling & Care & Assessment Management	High
3.	Electronic Medical Record	Low
4.	Reimbursement for Services	Low
5.	Screening / Intake / Enrollment	Medium
6.	Service Utilization, Outcome Tracking & Reporting	Low

The fit for each WITS section when compared to the enhanced CIMOR is shown in Table 20 and Figure 20.

From a functionality perspective WITS only one section rated high:

- Counseling & Care & Assessment Management High
- Screening / Intake / Enrollment Medium

While WITS is certainly an outstanding system several functions in the Functionality Comparison Matrix in the Appendix need to be added before implementation. However, WITS does already contain some of the planned CIMOR enhancements. These include the following:

- DMH Intra-agency Communication – 46
- Long Term Treatment, Discharge and Aftercare Planning – 63
- EMR Maintenance: Crisis Action Plan View – 65
- EMR Maintenance: Referral View - 67
- EMR Maintenance: Treatment Plan View – 68
- Registration / Admission / Program Assignment: Referrals Management – 90

- EMR Maintenance – 105
- Case Management: Consumer Group Management - 21
- Registration / Admission / Program Assignment: Referrals Management - 90
- Exchange client Information with Providers – 109

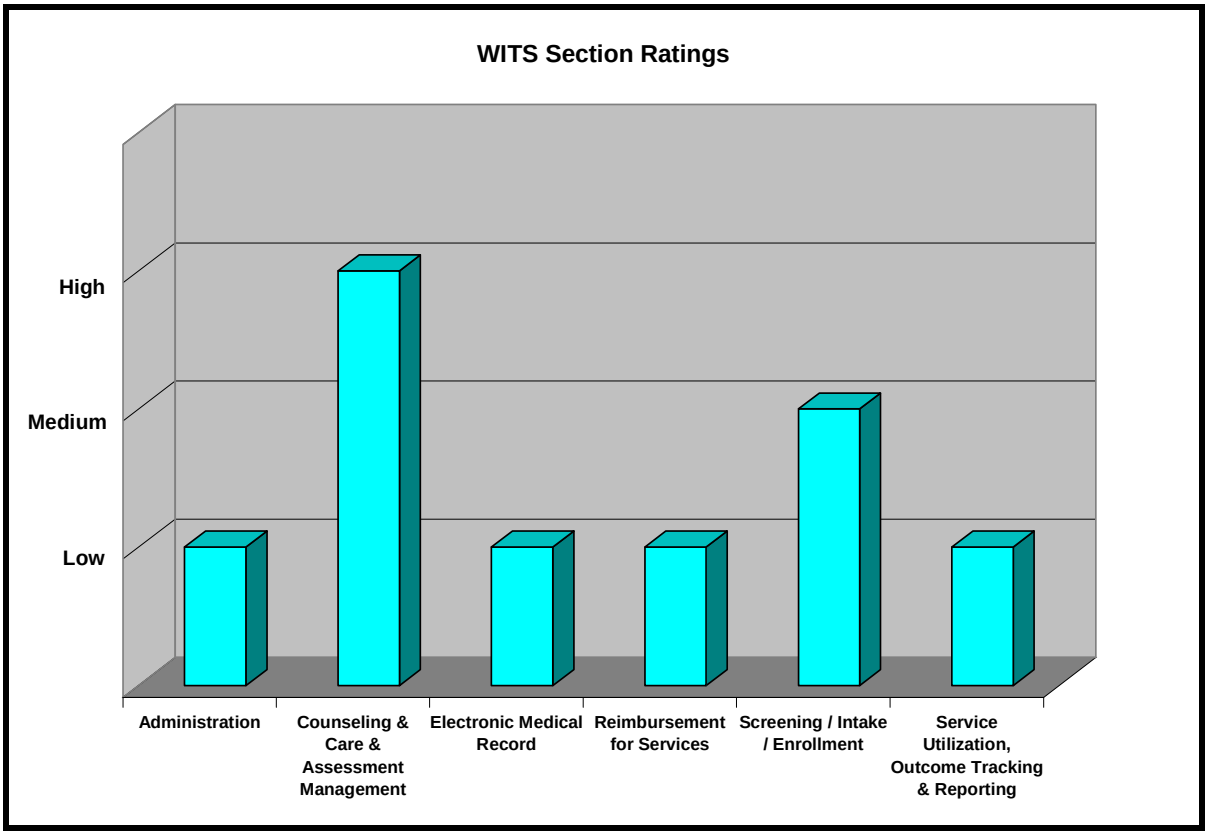

Figure 20. WITS Enhanced CIMOR Section Ratings

The Appendix contains the Functionality Comparison Matrix in which the reader may compare WITS to the other systems. In addition the individual function compatibilities (i.e., Yes / No value) may also be observed.

Regardless, WITS performs the functions listed in Table 21.

Table 21. WITS basic functions[88]

Line #	Module	Description
1.	Home	The Home Module is the first contact that the user has with the application. It includes the Announcement Section providing the user with an overall listing of internal news items. Also included is a schedule of all pertinent events as well as permitting the user to add events for other users to view.
2.	Agency	The Agency Module allows for the creation and management of information from state and local substance abuse organizations, but which are not direct service providers. This module is divided into two functions: • General Information:

[88] WITS Basics: Modules, http://www.witsweb.org/basics_modules.asp.

Line #	Module	Description
		– Provides place to collect agency profile information such as name, type and contact/logistics; • Management: – Multiple functions that handle the general information, management of agency staff, contracts/funding and facility certification.
3.	Governance Profile	Similar to the Agency Module in how it handles profile and general information, this module deals with provider information, ownership, its staff, contracts and the facility management. For those providers who have owners, there is a place within the module to create, edit and search for ownership.
4.	Contracts	The Contract Module provides a place within the WITS application for agency staff to manage all components of contracts with providers and sub-agencies. A detailed listing of upper agency contracts, as well as agency-to-agency contracts is available. This module is capable of collecting and reporting information on grant awards and funding allocations to providers.
5.	Referral	A critical moment in the treatment of a client is matching them with the best rehabilitation program suited to their individual needs. The Referral Module addresses the client's needs in two ways: The Outgoing-Creating Referral and The Incoming-Accepting Referral.
6.		**The Outgoing-Creating Referral** • Assessment of the client's needs is the first step in establishing where the client should be sent for rehabilitation, finding a facility that contains the services needed for treatment. If the recommended facility does not have the capacity to treat the client, the client can then be referred to a different facility till the appropriate facility has been matched with the client's treatment needs. • While the clinician is creating the referral record for the client, he will also verify the existence of a consent record. Note: A referral is only needed when the client attends a facility in a different provider. In the case of attending a different facility within the same provider, a referral is not needed, since different facilities in the same provider can share information.
7.		**The Incoming-Accepting Referral** • Receipt of the pending referral by the receiving facility prompts the staff to view the client's needs, along with the facility's availability. At this point a number of actions can occur. • First, the client's referral appointment can be processed. Second, the staff can verify the client's consent record (this will redirect the staff to the Consent Module for verification). Third, the staff can either accept or reject the client's referral for treatment at that facility. If the referral is accepted, a new client intake will be conducted. Otherwise, if the referral is rejected, then the sending facility needs to find a new treatment facility to treat the client.
8.	Wait List	The Wait List Module monitors the number of clients waiting for treatment, computes the time clients wait for treatment and trends in clients wait lists over time. Within this module, Alert Lists can be created for those clients who have surpassed a threshold of time waiting for treatment.
9.	Facility Management	The Facility Data Module provides for the management of individual facilities. Profile data (hours of operation, capacity, contact information), type of service delivery, available treatment services, and special population services (language interpreter, etc…) are listed within this module.

Line #	Module	Description
10.	Staff Management	This module is used to manage the staff information within a substance abuse treatment organization. The Staff Module allows for the creation, edit and search for staff that contains specific profile information, such as language fluency and educational background.)
11.	Billing/Claims	Providers and facilities can access information from the client services events to generate bills for Medicaid and Third Party Vendors. This module also accommodates grant-based service reimbursements as well as slot management models. Beyond the generating of invoices, the Billing Module contains functions for analyzing accounts receivable and revision and rebilling. The Analysis of Accounts Receivable tracks the invoices and payments received, in addition to providing a detailed analysis and reports on these invoices, payments and services. The Revision and Rebilling function tracks rejected claims and enables providers to correct and re-bill these claims to receive payment.
12.	Client Intake	The Client Intake module collects identifying information about a client to initiate treatment services within a facility, as well as to see if the client has been enrolled in a State treatment program and access information about previous treatment (subject to consent constraints.) This module is designed to accept multiple forms of identifiers, such as name, birth date, SSN, driver's license, gender, race/ethnicity and address. A client ID is issued for new patients and the existing ID is pulled for previously enrolled patients. Client IDs are unique statewide and not decodable, enabling the WITS system to accommodate HIPPA compliant IDs. This module enables the clinician to create and maintain a client's activities and related case information throughout the entire treatment process.
13.	Admission	This module permits for the entry of all client data required for federal and state reporting, demographics, substance abuse history, employment history and prior treatment report. Information gathered in this module enables the clinician to assess if the client requires placement within a special program or is eligible for special treatment. Referral information can also be viewed here if the client has been enrolled in a state program, though referral information is included as a separate module.
14.	Assessment	The Addiction Severity Index (ASI) is an assessment tool universally used in substance abuse treatment programs to provide uniform clinical determinations of the severity of the substance abuse problems. This module presents several types of ASI including the Drug Evaluation Network System (DENS) in both "full" and "lite" versions, the Behavioral Health Assessment (BHA), and the Treatment Assignment Protocol Assessment (TAP). These ASI are designed for either client combination or clerk data entry forms filled out by clients.
15.	Treatment Plan	The Treatment Plan Module enables the clinician to enter and manage client treatment activities and/ or procedures and services provided to the client. The treatment plan identifies the set of problems that the client is currently experiencing and then develops a set of goals to satisfy the problems. With this approach, discharge planning is an activity covered in the overall treatment plan.

Line #	Module	Description
16.	Client Disclosure Agreement	The WITS System is a consent driven system that facilitates information sharing between treatment providers. The Client Disclosure Agreement Module adheres to procedures consistent with CFR 42 federal regulations regarding the confidentiality of client substance abuse information. The module consists of two parts: • Consent Policy – This is the policy governing the client information exchange among providers. The information releasing provider must set up the consent policy prior to exchange of information. There are two kinds of policies. The first is the policy governing the information releasing provider with all of the other providers. The second policy is between the information releasing provider with the accepting provider. • Client Consent – This policy specifies the information that can be released to the treatment providers. Once this consent has been given, it cannot be modified, but it can be revoked. Only one client consent between two providers can exist within a specified time period.
17.	Reporting	The WITS system supports all federal reporting requirements. These reports are filed in conjunction with the requirements by SAMSHA. The generating of these reports is designed for the specific states and their internal requirements. A listing of reports in the WITS system is located below: TEDS GPRA SSA PPG DS 2000+.
18.	Discharge	The Discharge Module performs a number of functions from supporting the discharge process to providing a summary of a client's treatment program. A discharge case is created and records client information at the time of his/her discharge.

4.8.5 System Functional Weaknesses

Referring to both Table 20 and Figure 20 one may observe that WITS has several apparent sectional weaknesses.

From a functionality perspective WITS four of six sections rated low:

- Administration Low
- Electronic Medical Record Low
- Reimbursement for Services Low
- Service Utilization, Outcome Tracking & Reporting Low

In addition WITS has several enhancements in the Functionality Comparison Matrix in the Appendix that need to be added before implementation. The planned CIMOR enhancements that would have to be added include the following:

- EMR Maintenance: Physician Orders – 62

- EMR Maintenance: Summary Views – 64
- EMR Maintenance: Discharge Plan – 66
- Medicare, Medicaid, and Private Insurance: BizTalk MEIS Interfaces – 69
- EOC Forensic Services – 102
- EMR Maintenance: Lab – 106

As seen in Table 22 WITS also has 27 missing functions when compared to the existing CIMOR. These would have to be added before implementation too.

The reader should note that while WITS is indeed comprehensive it was written for other states and counties. Thus, the reader should not expect it to be a perfect match to the way DMH conducts its business. DMH should expect to make some adjustments to the way it conducts business so as to adapt to WITS.

4.8.6 Estimated Cost Range

Because WITS was developed using public funds, there is no charge for system development. However the system would have to be modified for DMH use. FEI.com, which now does the development for WITS, would be the agent making any and all system changes.

Table 22. WITS Estimated Costs

Line #	Annual Operating Cost Item	Cost
k.	**Missing function count**	27
l.	**System purchase / lease cost**	$0
m.	**Include Functions Currently in CIMOR**	$5,400,000
n.	**Implementation cost**	$1,080,000
o.	**Annual operating / maintenance cost**	$400,000
p.	**Include Functions Not Currently in CIMOR**	$1,332,000
q.	**Include Data Marts**	$876,000
r.	**Total first year costs (excluding enhancements)**	$6,880,000
s.	**Total first year costs (including Enhancements)**	$8,212,000
t.	**Total cost after first year**	$400,000

The assumption is made that the contract for developing the functions in Appendix 2 CIMOR Functionality Matrix would be given to FEI.com since WITS was developed by them. The reader should note that since FEI.com did develop WITS, it is intimately familiar with all aspects of the system. Thus, no added burden (i.e., no additional implementation expense) would be incurred for installing the newly developed functions.

4.8.7 Conclusion

FEI.com has been in business for less than 10 years. It has over 50 employees. FEI.com had annual revenues exceeding $8 million in 2004.

Web Infrastructure for Treatment Services (WITS) is a collaborative information technology approach to the planning, administration, and monitoring of Substance Abuse Treatment

Programs. WITS features numerous clinical, administrative, and reporting modules that are organized by workflow. [89]

WITS) is built with Microsoft's C# .NET framework using a SQL Server database. All system configuration and data exchange is handled using XML files. [90] WITS is typically a hosted system, but it can be owned and operated independently.

Overall WITS has a medium functionality fit. Due to the missing number of functions, WITS has only one high section rating and four low section ratings. Even with this WITS is one of the lower priced systems.

WITS is used in seven states and four counties.

[89] WITS California Homepage, http://california.witsweb.org/home.asp.
[90] Technology, http://california.witsweb.org/technology.asp.

Appendices

Appendix 1 Excerpts from Tier Report

Tier Report Excerpt

DMH identified the following functionality needed for an EMR, with all areas considered to be high priority: Scheduling, Computerized Physician Order Entry (CPOE), Treatment Planning, Progress/Case Notes Documentation, Clinical Assessments, External Consultations, Billing (CIMOR), Pharmacy (CIMOR), Dietary (CIMOR), Patient Admission, Discharge, Transfer (CIMOR).

SCHEDULING	
Definition	To schedule the delivery of habilitation, rehabilitation, and treatment
Types	Client, Provider, Treatment space, Treatment/Program Curriculum, Resources (vehicle, escort staff)
Organizations	CPS, Hab Centers
Synonyms	None
Mandatory/Optional	Mandatory for CPS and Hab Centers; Optional for Regional Centers
Notes	• Scheduling is varying and complex depending upon the division • Scheduling can drive resource usage such as nurse and escort needs • Excludes staff coverage
Integrated Interfaces	• Intervention (Treatment). As you schedule interventions, the program curriculum comes up • Functional link to progress notes: once a scheduled activity is delivered, there is an automatic link to documentation that allows for a group note for all individuals in the group and the capacity to add individualized information specific to each member • Need to link back to billing (Out of Scope)

COMPUTERIZED PHYSICIAN ORDER ENTRY (CPOE)	
Definition	Physician directives regarding the type of care a patient is to receive.
Types	• Medication Administration; explicit coding • Laboratory Orders; explicit coding • Pharmacy • Dietary Orders • Activity Orders (e.g., Pass/Privileges); free text • Admission/Discharge/Transfer Decisions • Consultation Orders; free text
Organizations	CPS, Habilitation Centers
Synonyms	None
Mandatory/Optional	Mandatory for CPS, Hab centers
Notes	Numerous notes. See Tier Report Appendix B, Meeting Minutes.
Integrated Interfaces	• Pharmacy (Out of Scope) • Dietary (Out of Scope) • Lab • Patient Admission, Transfer, and Discharge (CIMOR) (Out of Scope) • Medication Administration

Tier Report Excerpt

	• CPOE Med Admin Pharmacy • Patient Education (Treatment Plan)

TREATMENT PLANNING	
Definition	**Definition/Treatment Planning:** Summarizing the assessments and organizing the delivery of services to achieve client outcomes and/or resolve problems. **Definition/IEP:** Standards and forms driven by the Department of Education and Special Education; may want to be able to capture its image, rather than build it into the EHR, save for tracking through the QA tool whether one has completed, who is assigned, and when due for revision.
Types	• Person centered (outcome focused) • Problem centered • Discharge Plan • Individualized Education Plan (IEP), goal oriented, from DESE, imaging may be needed. (this is like an external consult.) • Personal Safety Plan (Advanced Behavioral Healthcare directive). How best to treat a client when restricting rights, restraining, and other issues. • Patient Education • Discharge Plan
Organizations	CPS, Habilitation Centers, Regional Centers
Synonyms	IP - Individual Plan IHP - Individual Health Plan ITP - Individual treatment Plan
Mandatory/Optional	Mandatory: CPS, Hab Centers, Regional Centers
Inputs/Outputs	• IEP, treatment plan
Notes	Numerous notes. See Tier Report Appendix B, Meeting Minutes.
Integrated Interfaces	• Reporting Tools (Out of Scope) • Case/Progress Notes (need to capture headings from progress notes to make treatment planning review less cumbersome) • Scheduling • Billing (Out of Scope) • CPOE (read only for treatment plan revisions). Discussion centered on whether this would require changing the entire treatment plan and whether the treatment team would need to get together and sign the plan.

PROGRESS/CASE DOCUMENTATION	
Definition	Progress Notes: Evaluating and summarizing services provided and progress towards achieving goals or outcomes on the treatment plan for summarizing client contacts and ancillary patient information and for justifying medical records and recording the results of consultations and labs. This includes observation by para-professionals, documentation of services provided by clinicians and monthly summaries of progress across interventions. This is tied to the individualized habilitation plan.
Types	Progress Notes Case Notes

Tier Report Excerpt

	Clinical Records Flow Sheets
Organizations	CPS, Hab Centers, Regional Centers
Synonyms	Case Notes: The same as above, but not necessarily linked to the individualized habilitation plan, Service Log
Mandatory/Optional	CPS, Hab Center, Regional. (Flow sheets and clinical records not a part of Regional Center)
Inputs/Outputs	Case Notes/Progress Notes
Notes	• The progress is recorded at varying frequency by various staff depending upon the organizational structure; some are tied to treatment plans. • Review existing assessments
Integrated Interfaces	• Billing (Out of Scope) • Treatment Plans • Patient Education • External Consultations • CPOE

CLINICAL ASSESSMENTS	
Definition	To collect initial set of information which establishes a baseline to determine what is wrong and to guide care and design the treatment plan. Also helps determine eligibility for services.
Types	• Admission Screening • Risk Assessment/Integrated Risk • Dietary • Educational • Occupational • Physical Therapy • Medical • Psychiatric • Social Service • Psychological • Substance Abuse • Pain • Choking • Speech • Vocational • Meal time observation • Risk for Fall • A significant number of other assessment types exist
Organizations	CPS, Hab Centers, Regional Centers
Synonyms	None
Mandatory/Optional	Mandatory for all
Notes	• Need an integrated assessment module that allows for all of the various assessments to be accessed and reviewed • Need imaging • Review existing assessments • Standards
Integrated Interfaces	• CPOE • External Consult • Progress Notes/Case Notes

Tier Report Excerpt

EXTERNAL CONSULTATIONS	
Definition	Any type of assessment or healthcare completed from providers outside of the facility.
Types	Unidentified
Organizations	Unidentified
Synonyms	Includes referral for treatment
Mandatory/Optional	Optional for automated solution but mandatory for business process
Notes	• Clients are seeing so many different types of external consultants that vary in terms of duration, location • Initiated by the physician (CPOE) • Schedule appointment • Track external consult (with notification) - This is optional for Regional Centers • File copies of external documents (imaging) • Feature: Web client for external consultations • Feature: HL7 data exchanges
Integrated Interfaces	• CPOE • Scheduling

EXCHANGING CLIENT INFORMATION WITH PROVIDERS	
Definition	Exchanging needed client information with outside providers for continuity of care. This is interwoven throughout the process. A provider can be an administrative agent. **Export Information** Assessments Treatment Summary Discharge Summary and Aftercare Plans HIPPA transactions
Types	None
Organizations	CPS, Hab Centers, Regional Centers.
Synonyms	
Mandatory/Optional	Automation optional
Notes	Standards • CMS (Center for Medicare and Medicaid Services) • ICFMR • HICFA • JCAHO (Joint Commission on Accreditation of Healthcare Organizations • Behavioral Healthcare • State Medicaid Waiver Guidelines • DMH Licensure and Certification • Enterprise Wide Technical Architecture for the State CIO Office
Integrated Interfaces	• Assessments • Treatment Plans

Tier Report Excerpt

HIGH LEVEL CLINICAL REQUIREMENTS	
DMH identified the following high-level clinical requirements needed for an EMR. Priorities were ranked as either high, medium, or low.	
LEVEL 1 HIGH PRIORITY REQUIREMENTS	• Graphical User Interface (GUI) front end • User friendly • Requires limited training /Intuitive • Web Based • DMH hosted • Flexible enough to allow various organization to only the system they need • Pharmacy Integration • Episode of care needs to permit multiple physicians to care for a single individual • Lab Integration • Meets standards (meets hospital and ICFMR standards for medical records). • Purchase/upgrade cost • Highly available 24/7 • Highly reliable 97-99% • Architecture (DMH Architecture is .NET, SQL Server) • Electronic Signature
LEVEL 2 MEDIUM PRIORITY CLINICAL REQUIREMENTS	• Integrated Reporting/works with third Party Package • Code Table Driven • Application Security □□ Role based • Spell Check built in/word processing (3rd party package/import/export) • Mobile computing (PDAs Tablet PCs) • Supports Wireless technologies (lab carts, laptops) • Does IT allow print screen capabilities • Medical records (back office) included • Purchase/upgrade model • Vendor Support Model 24/7 with toll free number • IT staff skill set(s) required to support package
LEVEL 3 LOW PRIORITY CLINICAL REQUIREMENTS:	• Structured Nomenclature • Structured Documentation • Bed assignment at various levels (CIMOR or CIMOR Interface)

End Tier Report Excerpt

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
1.	Access to Recovery (ATR)	1.	Access to Recovery (ADA ATR)	Yes	Yes	Administration and implementation of business rules to support the ADA grant for Access to Recovery, including voucher management and services delivery.
2.	Accounts Payable (Adjudication)	2.	Account Transactions Search	Yes	N/A	Ability to search all payment transactions for details of payments
		3.	Accounts Payable	Yes	N/A	Delivered services receive appropriate edits, check business rules, find appropriate payer plan and prepare HIPAA-compliant claims for payers and non-HIPAA compliant transactions to SAM II.
3.	Accounts Receivable (Claims Processing)	4.	Billing/Claims (Financial Clearinghouse)	Yes	Yes (Medicare & Insurance claims automation in future)	Claims processed in HIPAA-required EDI format to Medicaid, Medicare, Insurance companies. Claims processed in non-HIPAA format to SAM II.
		5.	Claims Search	Yes	N/A	Ability to search through claims information to find details of submissions and payments
		6.	External Claims Search	Yes	N/A	Ability for providers to search claims information for details of services submitted and paid
		7.	Accounts Receivable (Financial Clearinghouse)	Yes	N/A	State facility delivered services into HIPAA-compliant claims for appropriate payers (Medicaid, Medicare, insurance). Claims processing in HIPAA-required EDI format.
		8.	Accounts Receivable	Yes	N/A	Accept non-HIPAA claims from SAM II for consumers, guardians, consumer banking and families for services provided.
		9.	Payment Search	Yes	N/A	Ability to search payments and tie back to claims/invoices and services billed
		10.	Payment Receipt with Adjustments	Yes	N/A	Interface with SAM II to retrieve payment check and data.
		11.	Account Transactions Search	Yes	N/A	Ability to search transactions to determine balance of accounts
		12.	BizTalk 835 Receive EOB (required fields)	Yes	N/A	Receive HIPAA 835 based on professional services/claims processed by payers
		13.	BizTalk 837 Receive Professional Claim	Yes	N/A	Receive HIPAA 837 Professional services claims from batch providers
4.	Administration (code tables and setups)	14.	Internal Service Code Management	Yes	N/A	Administration of code tables and edits, including service categories, service types, diagnosis groups.
5.	Assessments	15.	Assessments	Partial	Yes	Variety of assessments to be determined.

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
		16.	State Reporting Assessment	Partial	Yes	Support assessments data required for state reporting
		17.	Clinical Intake Screening	Partial	Yes	High-level screening upon enrollment to determine if consumer has service needs across DMH divisions.
6.	Authorization / Request / Approval / Review	18.	Treatment Authorization Request	Yes	N/A	Consumer-specific service authorization request to DMH. Non-consumer specific administrative and shadow claims.
		19.	Treatment Authorization Approval	Yes	N/A	Authorization approval and utilization review processes. Budget info for ISL to create service authorizations and document for SCL providers.
7.	Benefit Eligibility	20.	Eligibility	Yes	N/A	Determination of benefits and financial eligibility. Medicaid eligibility data retrieval from Dept. of Social Services files currently retrieved from MEIS. Social Security Administration retrieval of SSN verification process.
8.	Case Management	21.	Consumer Group Management	Partial	Yes	Schedule of consumer visits or treatment appointments in group settings.
		22.	Caseload Management	Yes	N/A	Case managers' ability to view regular consumers, enter service logs, and print consumer lists.
9.	Claims Adjudication and Payment	23.	Service Processing Log	Yes	N/A	Ability to see services processed through details of claims and payments made
		24.	Billing/Claims (Financial Clearinghouse)	Yes	N/A	Claims processed in HIPAA-required EDI format to Medicaid, Medicare, Insurance companies. Claims processed in non-HIPAA format to SAM II.
		25.	Claim Form with Adjustments	Yes – in process	N/A	Ability to adjust claims with void functionality and re-bill capability
		26.	Claims Adjudication	Yes	N/A	Explanation of Benefits requirements and display of eligibility information. Ability to link back to Medicaid services and enter as delivered services for CPR Medicaid Program.
		27.	Payment Search	Yes	N/A	
		28.	Payment Receipt with Adjustments	Yes	N/A	Interface with SAM II to retrieve payment check and data.

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
10.	Claims Data Entry and Capture	29.	Encounter Reporting (Delivered Services)	Yes	N/A	Ability to report on all services delivered to a consumer
		30.	EOC Service Entry	Yes	N/A	Delivered service data entry for both authorized and non-authorized services. Includes case management notes field. Ability to add multiple services and service categories for one or several consumers.
		31.	Services Management	Yes	N/A	Ability to enter and make corrections to services delivered to each consumer
		32.	Claim Form with Adjustments	Yes – in process	N/A	Ability to submit claims for service payment and make adjustments through void and re-bill as needed
11.	Claims Error Resolution	33.	Service Processing Log	Yes	N/A	Ability to see services details and any changes made to services for billing
		34.	External Claims Search	Yes	N/A	Ability for contract providers to see claims entered and submitted
12.	Clinical Intake Screening	35.	Clinical Intake Screening	Yes	N/A	High-level screening upon enrollment to determine if consumer has service needs across DMH divisions.
13.	Complex Allocation Management	36.	Fund Management (Allocations)	Yes	N/A	Maintenance of SAM II appropriations and other required data for payment. Allocating DMH funds (through payer plans and service categories) to enrolling DMH and contract providers.
14.	Consumer Banking	37.	Client Banking	Yes	Yes (1099)	Management of consumer funds held in trust by state-owned facilities. Includes deposits (manual and electronic), withdrawals, transfers, calculation of interest, and 1099 preparation/submission.
15.	Management of Consumer Demographics	38.	Consumer Demographics	Yes	N/A	Management data distribution of consumer demographics and check printing
		39.	Face Sheet Summary	Yes	N/A	Printable summary of consumer demographics for record
16.	Contact Management	40.	Contact Log	Yes	N/A	Contact management to track details of calls or visits to consumers
17.	Co-Pays that are not ATP	41.	Includes SATOP fees	Yes	N/A	Apply SATOP fee to SATOP services. All consumers entering SATOP must pay both a $120 assessment screening fee at the time of their appointment and a $125 supplemental fee at the time of their assessment.
18.	Delivered Services (Encounter Data	42.	Encounter Reporting (Delivered Services)	Yes	N/A	Ability to report on services delivered to a consumer

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
	Entry)	43.	EOC Service Entry	Yes	N/A	Delivered service data entry for both authorized and non-authorized services. Includes case management notes field. Ability to add multiple services and service categories for one or several consumers.
		44.	Services Management	Yes	N/A	Ability to enter and update services delivered to consumers
19.	Diagnosis	45.	Diagnosis	Yes	N/A	Data entry and management of diagnosis axes for both DSMIV and ICD9 code sets
20.	DMH Intra-agency Communication	46.	Messaging	No	TBD	Automated messaging at specified action points within CIMOR processes
21.	Eligibility Maintenance	47.	Eligibility	Yes	N/A	Determination of benefits and financial eligibility. Medicaid eligibility data retrieval from Dept. of Social Services files currently retrieved from MEIS. Social Security Administration retrieval of SSN verification process.
22.	Episode of Care (EOC) / Commitments / Court Orders	48.	Episode of Care Court Order Views Display all episodes of care	Yes	N/A	Summary of Episode of Care details in printable format Lists all EOCs for Consumer to enable service providers to see history of treatment. Provides printable summary.
23.	Fiscal Intermediary	49.	Fiscal Intermediary (MRDD)	Yes	N/A	Administration of family-directed support program to allow families to hire support and report hours worked for payment by fiscal intermediary. Includes electronic interface to the fiscal intermediary vendor.
24.	HIPAA Transaction Translation	50.	BizTalk Payer Transactions (non-HIPAA)	Yes	N/A	Interface from SAM II for invoice payments
		51.	BizTalk provider Transactions (non-HIPAA)	Yes	N/A	Accept non-HIPAA consumer demographics pre-encounter data from batch providers
		52.	BizTalk Transactions	Yes	N/A	Utilizing Microsoft BizTalk to verify transactions and automate processing
		53.	BizTalk 837 Send Professional Claim	Yes	N/A	Send HIPAA 837 Professional claim data to payers (Medicaid, Medicare, Insurance) based on DMH facility and contract provider services/claims
		54.	BizTalk 835 Receive EOB (required fields)	Yes	N/A	Receive HIPAA 835 based on professional services/claims processed by payers
		55.	BizTalk 837 Receive Professional Claim	Yes	N/A	Receive HIPAA 837 Professional services claims from batch providers

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
		56.	BizTalk 835 Send Professional Claim	Yes	N/A	Send HIPAA 835 transaction to batch providers
		57.	BizTalk Send 837 Institutional Claim	Yes	N/A	Send HIPAA 837 Institutional claim data to payers (Medicaid, Medicare, Insurance) based on DMH facilities services/claims
		58.	BizTalk Receive 835 Institutional EOB	Yes	N/A	Receive HIPAA 835 based on Institutional services/claims processed by payers
25.	HIPAA / EDI Trading Partner Maintenance and Certification	59.	Capturing NPI and applying to claims documents as required by HIPAA	Yes	N/A	Handling HIPAA NPI identifiers with contract providers
26.	Human Resource Management	60.	Human Resources	Yes	N/A	Handle adding and removing organization's employee resources to enable reporting of service delivery data
27.	Event Management and Tracking (EMT)	61.	Incident Tracking	Yes	N/A	EMT records all incidents, injuries, abuse & neglect, behaviors, and investigations tracking.
28.	Medical Record Maintenance	62.	Physician Orders	No	Yes	Physician and nursing orders
		63.	Long Term Treatment, Discharge & Aftercare Plans	No	Yes	Treatment plans, aftercare plans, habilitation plans, discharge plans.
		64.	Summary Views	No	Yes	Medical record-related information summarized for quick-view or analysis purposes
		65.	Crisis Action Plan View	No	Yes	Printable summary of specific actions planned
		66.	Discharge Plan	No	Yes	Printable summary of plan for discharge
		67.	Referral View	No	Yes	Printable summary of consumer referral
		68.	Treatment Plan View	No	Yes	Printable summary of consumer treatment plan
29.	Medicare, Medicaid, and Private Insurance	69.	Department of Social Services (DSS) Medicaid Eligibility Interface	Yes	N/A	Interface with Dept. of Social Services for Medicaid eligibility information from a nightly process
30.	MRDD Independent Supported Living (ISL) Budgets	70.	ISL Budgets	Yes	N/A	Generating budgets and invoices for MRDD's ISL residential consumers
31.	Organization Management	71.	Organization Management	Yes	N/A	Physical and legal entity description of enrolling providers, other contract providers, and state-owned facilities including any sites described. DMH Facility Units, Unit/Wards, Rooms, Beds. Defining relationship with any entity that provides services to clients.

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
32.	Outcomes	72.	Delivered Services Data Mart	Minimal	Yes	Provide access to data warehouse data in appropriate format to handle easy analysis and summary of services provided to consumers
		73.	Outcomes Web Replacement	Minimal	Yes	Inclusion of screens for collecting outcomes assessment information and ability to print the assessments.
33.	Payer Plans	74.	Payer and Plan Management (Payers)	Yes	N/A	Administration of divisional payer plans
		75.	Plan Calculation Rules	Yes	N/A	Establish related business rules
34.	Practitioners	76.	Practitioner Group Management	Yes	N/A	Practitioner data for DMH staff and contract provider staff. Credentials, licenses, certifications, and degrees included. Interface with SAM II to update DMH staff and related information.
35.	Prioritization in applying Standard Means Test (SMT)	77.	Applying Standard Means Test to invoices based on DMH priorities	Yes	Yes	Application of standard means test (consumer ability to pay) during payer determination and invoice generation using priorities for programs established by DMH.
36.	Property / Bed Management	78.	Bed Management	Yes	N/A	Inpatient room and bed management for DMH Facility Units & Wards.
37.	Provider Rate-setting	79.	Usual & Customary Fees Management	Yes	N/A	Administration of contract service rates and provider contracts
38.	Provider / Contract Management	80.	Provider Contract Management	Yes	N/A	Setting up contracts for services categories and services. Additional provider Demographics.
39.	Registration / Admission / Program Assignment	81.	Enrollment	Yes	N/A	Registration to a division/facility/site and admission to a service program and level of care. Program eligibility determination and assignment.
		82.	Program Management	Yes	N/A	Management movement between programs and implementation of program business rules as needed
40.	SAM II Link / SAM II HR Link	83.	SAM II Interfaces	Yes	N/A	Interfaces with SAM II and the DMH SAM II data warehouse to send invoice information and retrieve payment check and date and DMH staff records.
41.	Standard Means Test (SMT) applied as serviced are delivered	84.	Standard Means Test during Payer Determinations process	Yes	N/A	Application of standard means test (consumer's ability to pay) during payer determination and invoice generation processes
42.	Substance Abuse	85.	SATOP Program Support	Yes	N/A	SATOP data collection screens and tracking of SATOP completions.

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
	Traffic Offenders Program (SATOP)		(originally a link within initial SOW)			Printing of SATOP forms.
43.	Supported Community Living, used by both CPS and MRDD	86.	SCL	Yes	N/A	Generate invoices for consumers services in Supported Community Living program
44.	Third Party Liability (TPL)	87.	Insurance Billing	No	Yes	Automated generation and processing of insurance claims
45.	Utilization Review	88.	Inpatient Utilization Review	Yes	N/A	Determination of need for continued stay in inpatient facilities.
46.	Waiting Lists	89.	Waiting Lists	Yes	Yes	Management of future services that may be provided to a consumer, for which a consumer is waiting.
		90.	Referrals Management	No	Yes	Handle external referrals detail information and tracking for consumer records
		91.	Authorization XML Viewer	No	No	Process not used
		92.	Service Delivery Matrix Management	Yes	N/A	Administration of service categories, service types, and services matrix
		93.	User Access Security Management	Yes	N/A	HIPAA-compliant security access incorporated into system screens and functions through specified roles
		94.	User Role Management	Yes	N/A	Ability to add and remove security roles through automated request and approvals
		95.	Pre-Billing Services (Financial Clearinghouse)	Yes	No	Processing of business rules to support billing decisions
		96.	Pre-billing Services Management	Yes	No	Ability to make corrections and review services entries prior to billing to payers
		97.	Mental Status Exam	No	TBD	Implementation of an assessment or screening regarding mental status of consumer.
		98.	Symptoms List	No	TBD	Look-up of symptoms to aid physician service delivery
		99.	Rapid Intake w/Assessment Screening	Yes	No	Reference to screen that captures all data required for an emergency intake process with minimal information available
		100.	BizTalk Send 835 Institutional Claim to provider	No	No	Send HIPAA 835 transaction data to provider based on claims processed

IQ #	Business Function in Interview Questionnaire (IQ)	ID #	Identified (ID) Sub-Function	Currently In CIMOR	Planned CIMOR Enhancement	Function Description
		101.	Online Help	Yes	Yes	Easily accessible help information to assist users with various activities within the system
		102.	EOC Forensic Services	No	Yes	Forensic orders
		103.	Dietary (CBORD)	Yes	N/A	Dietary functions implementation at DMH facilities with future interface to CIMOR.
		104.	Pharmacy & Pharmacy link (QuadraMed)	Yes	N/A	Pharmacy functions implemented as provided in contract with vendor. Interface planned for later implementation
		105.	Electronic Medical Records Maintenance	No	Yes	Electronic medical records of all consumers being served
		106.	Lab	No	Yes	Lab function including doctor's orders
Additional Functionality mention in EHR Evaluation Report and not listed above.		107.	Progress/Case Documentation	No	Yes	Evaluating and summarizing services provided and progress towards achieving goals or outcomes on the treatment plan for summarizing client contacts and ancillary patient information and for justifying medical records and recording the results of consultations this is tied to individualized habilitation plan.
		108.	External Consultations	No	Yes	Any type of assessment or healthcare completed from providers outside a facility. Integrated with CPOE and scheduling.

Appendix 2 CIMOR Functionality Matrix

IQ # (1)	Business Function in Interview Questionnaire (IQ) (Sept. 2007) (2)	ID # (3)	Identified (ID) Sub-Function (Sept. 2002) (4)	Currently In CIMOR (5)	Planned CIMOR Enhancement (6)	Function Description (7)
1	Access to Recovery (ATR)	1	Access to Recovery (ADA ATR)	Yes	Yes	Administration and implementation of business rules to support the ADA grant for Access to Recovery, including voucher management and services delivery.
5	Assessments	15	Assessments	Partial	Yes	Variety of assessments to be determined.
		16	State Reporting Assessment	Partial	Yes	Support assessments data required for state reporting
		17	Clinical Intake Screening	Partial	Yes	High-level screening upon enrollment to determine if consumer has service needs across DMH divisions.
8	Case Management	21		Partial	Yes	Schedule of consumer visits or treatment appointments in group settings. Include a link to progress notes.
14	Consumer Banking	37	Client Banking	Yes	Yes (1099)	Management of consumer funds held in trust by state-owned facilities. Includes deposits (manual and electronic), withdrawals, transfers, calculation of interest, and 1099 preparation/submission.
20	DMH Intra-agency Communication	46	Messaging	No	TBD	Automated messaging at specified action points within CIMOR processes
28	Medical Record Maintenance	62	Physician Orders	No	Yes	Physician and nursing orders
		63	Long Term Treatment, Discharge & Aftercare Planning	No	Yes	Treatment plans, aftercare plans, habilitation plans, discharge plans.
		64	Summary Views	No	Yes	Medical record-related information summarized for quick-view or analysis purposes
		65	Crisis Action Plan View	No	Yes	Printable summary of specific actions planned
		66	Discharge Plan	No	Yes	Printable summary of plan for discharge
		67	Referral View	No	Yes	Printable summary of consumer referral
		68	Treatment Plan View	No	Yes	Printable summary of consumer treatment plan
32	Outcomes	72	Delivered Services Data Mart	Minimal	Yes	Provide access to data warehouse data in appropriate format to handle easy analysis and summary of services provided to consumers
		73	Outcomes Web Link	Minimal	Yes	Inclusion of screens for collecting outcomes assessment information and ability to print the assessments.

IQ # (1)	Business Function in Interview Questionnaire (IQ) (Sept. 2007) (2)	ID # (3)	Identified (ID) Sub-Function (Sept. 2002) (4)	Currently In CIMOR (5)	Planned CIMOR Enhancement (6)	Function Description (7)
35	Prioritization in applying Standard Means Test (SMT)	77	Applying Standard Means Test to invoices based on DMH priorities	Yes	Yes	Application of standard means test (consumer ability to pay) during payer determination and invoice generation using priorities for programs established by DMH.
44	Third Party Liability (TPL)	87	Insurance Billing	No	Yes	Automated generation and processing of insurance claims
46	Waiting Lists	89	Waiting Lists	Yes	Yes	Management of future services that may be provided to a consumer, for which a consumer is waiting.
		90	Referrals Management	No	Yes	Handle external referrals detail information and tracking for consumer records
		91	Authorization XML Viewer	No	No	Process not used
		97	Mental Status Exam	No	TBD	Implementation of an assessment or screening regarding mental status of consumer.
		98	Symptoms List	No	TBD	Look-up of symptoms to aid physician service delivery
		101	Online Help	Yes	Yes	Easily accessible help information to assist users with various activities within the system
		102	EOC Forensic Services	No	Yes	Forensic orders
		105	Electronic Medical Records Maintenance	No	Yes	Electronic medical records of all consumers being served
		106	Lab	No	Yes	Lab function including doctor's orders
Additional Functionality mention in EHR Evaluation Report and not listed above.		107	Progress/Case Documentation	No	Yes	Evaluating and summarizing services provided and progress towards achieving goals or outcomes on the treatment plan for summarizing client contacts and ancillary patient information and for justifying medical records and recording the results of consultations this is tied to individualized habilitation plan.
		108	External Consultations	No	Yes	Any type of assessment or healthcare completed from providers outside a facility. Integrated with CPOE and scheduling.

Appendix 3 Hardware Description

Hardware is a commodity that changes rapidly with technology. The driving factor is the ability of the software to perform work to accomplish defined objectives. Thus, while the current CIMOR hardware certainly has the capability for significant expansion, it will sooner or later be eclipsed by new faster technology.

The CIMOR system is a three-tier (3-tier), web-based application written in C# (pronounced “see sharp”) that serves internal DMH staff and external contractors. CISCO network equipment is used throughout, and each CIMOR server involved runs some version of Windows Server 2003 on IBM hardware. Figure 21 provides a high-level overview how CIMOR is put together.

The approximately 2,500 DMH providers outside the State network (i.e., external users) may access CIMOR using either a web browser such as Windows Internet Explorer or by batching transactions (e.g., claims). They use whatever connectivity they have available such as DSL or a telephone land line to connect to the Internet (i.e., the Internet cloud in Figure 21).

About 3,000 DMH personnel (i.e., internal users) connect to CIMOR from either a State facility or from the Department's central office in Jefferson City. Just as DMH providers, these internal users connect to CIMOR using a web browser. Remote DMH facility staffs connect at varying speeds to the Department's central office using the internal Wide Area Network (WAN).

Figure 22 provides a list of both the CIMOR hardware and software currently in place in Figure 21. What is significant about Figure 22 is the quantity and type of equipment. That is, there are multiple servers each with multiple processors and there is SAN storage.

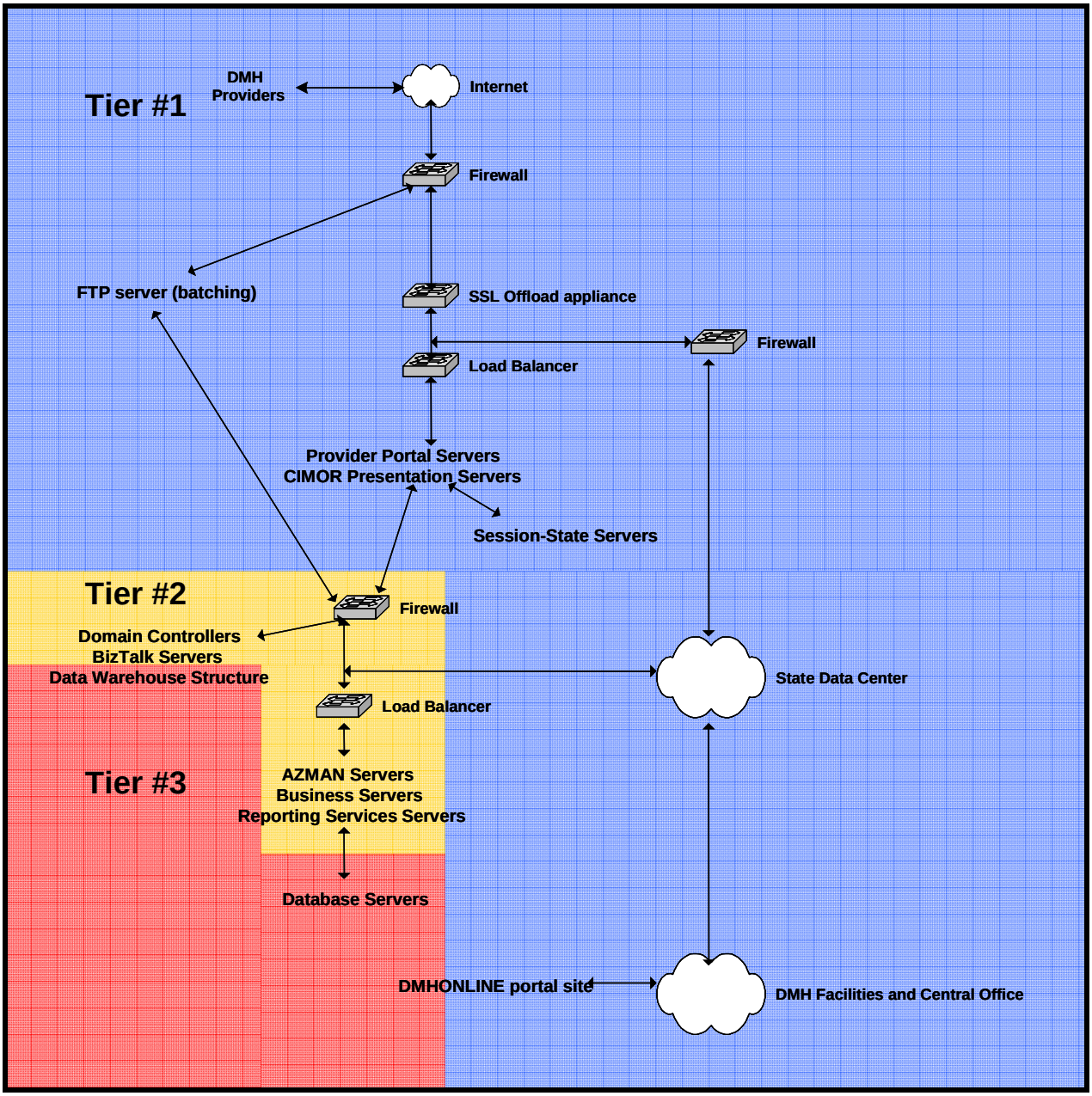

Figure 21 CIMOR Structural High-level Overview 08-18-07

CIMOR HARDWARE AND SOFTWARE

Function	Make	Model	Operating System	Quantity	Processor Speed	Processor Count	Memory	Disk Capacity	RAID Config	UPS Capabilities	
CIMOR Presentation Servers	IBM	HS20 Blade	W2K3 Web	8	3.2 GHz	1	2 GB	36 GB	1	SDC	Front-end
Provider Portal Servers	IBM	HS20 Blade	W2K3 Web	2	3.2 GHz	1	2 GB	36 GB	1	SDC	
Session-State Servers	IBM	HS20 Blade	W2K3 Std	2	3.2 GHz	1	2 GB	36 GB	1	SDC	
Domain Controllers	IBM	xSeries 330	W2K3 Std	2	1 GHZ	2	1 GB	18 GB	1	SDC	Management/Authentication
Backup Management Server	IBM	xSeries 345	W2K3 Std	1	3.2 GHz	2	3 GB	108 GB	5	SDC	
IBM Management Server	IBM	xSeries 345	W2K3 Std	1	3.2 GHz	2	3 GB	108 GB	5	SDC	
AZMAN Servers	IBM	HS20 Blade	W2K3 Std	5	3.2 GHz	2	4 GB	36 GB	1	SDC	Authorization
Business Servers	IBM	HS20 Blade	W2K3 Web	2	3.2 GHz	2	2 GB	36 GB +SAN	1	SDC	Business
Database Servers	IBM	xSeries 3950	W2K3 Ent	1	3.3 GHz	8	16 GB	73 GB +SAN	5	SDC	Database
FTP Server (Staging)	IBM	HS20 Blade	W2K3 Std	1	3.2 GHz	1	2 GB	36 GB +SAN	1	SDC	FTP/BizTalk
FTP Server (SFTP Server)	IBM	HS20 Blade	W2K3 Std	1	3.2 GHz	1	2 GB	36 GB	1	SDC	
BizTalk Servers	IBM	HS20 Blade	W2K3 Std	6	3.2 GHz	2	4 GB	36 GB	1	SDC	
BizTalk SQL Servers	IBM	xSeries 366	W2K3 Ent	2	3.2 GHz	4	8 GB	102 GB +SAN	5	SDC	
Message Queue Server	IBM	HS-21 Blade	W2K3 Ent	2	3.0 GHz	4	4 GB	73 GB +SAN	1	SDC	
EDW Database Server	IBM	HS-40 Blade	W2K3 Ent	1	3.0 GHz	4	16 GB	SAN		SDC	Reporting
EDW OLAP Server	IBM	HS-40 Blade	W2K3 Ent	1	3.0 GHz	4	10 GB	SAN		SDC	
Reporting Services Server 1	IBM	HS20 Blade	W2K3 Std	1	3.6 GHz	2	4 GB	73 GB	1	SDC	
Reporting Services Server 2	IBM	HS-40 Blade	W2K3 Std	1	3.6 GHz	2	4 GB	73 GB	1	SDC	

SDC UPS Capabilities:

The SDC is protected by a UPS Liebbert dual module unit with a Central Control Cabinet. Each module is rated at 300 KVA with the maintenance bypass breaker rated at 530 KVA. The data center is currently running around 200 KVA so each unit is serving as a redundant module. There is also a surge suppression unit installed before the UPS system.

Figure 22 CIMOR Hardware and Software

Appendix 4 Software Description

In 2001, ITSD elected to use Microsoft .NET architecture for developing CIMOR. Microsoft .NET in some ways is much like Lego blocks. Lego blocks come in different sizes, shapes, and colors. They are simple structures that can be combined to form objects limited only by imagination.

Microsoft .NET provides the building blocks and connections for interconnecting systems, information, and devices through Web services, which are small, reusable programs that allow computers to talk to each other even if the computers do not have the same Microsoft Windows operating system (i.e., Windows Vista, Windows Server 2003, and Windows XP).[91] These small, reusable applications are just like Lego blocks. These web services are then put together to allow both people and computers to work more effectively together. The .NET technology is an integral feature of new Microsoft products.

CIMOR was developed as a 3-tier architecture system. The three layers or tiers in CIMOR are clearly shown in Figure 21. The first tier (i.e., Tier 1 in blue) is the data presentation layer, which provides the graphical users interface (GUI) to the end user (i.e., it is what the users sees on his/her computer screen). Tier 2 in yellow is the business logic layer in which business functions are executed (e.g., claims processing). Finally Tier 3 is the database layer (or data services) in which DMH's data resides.

The 3-tier architecture isolates each major piece of functionality, so that the presentation (i.e., GUI) is independent of the processing rules and business logic, which in turn is separate from the data.

CIMOR's software, which is split into two major software categories:

- System
- Application development

For the purposes of this report both Microsoft Windows 2003 Server and Microsoft SQL Server 2000 are classified as system software, while C# is classified as application development software.

As observed in Figure 22, CIMOR uses the following two system software components:

- Microsoft Windows 2003 Server
- Microsoft SQL Server 2000.

Windows 2003 Server has multiple versions or editions, some of which are shown in Figure 22 and described here:

- **Standard** Edition – Targets departmental work areas providing services such as printing, file sharing, and Internet access
- Enterprise **Edition** – Targets the organization for its mission-critical workloads such as business applications (e.g., inventory, vehicle maintenance, etc.), Web services (e.g., Internet sales, email, etc.), and infrastructure (e.g., security, device management, etc.)

[91] .NET Framework 3.0 Versioning and Deployment Q&A, http://msdn2.microsoft.com/en-us/netframework/aa663314.aspx.

- Web **Edition** – Targets dedicated Web serving and hosting and is a key part of the .NET Framework.

End users use query tools such as SAS, Excel, Access, etc. to pull information from the tables on the SQL server to their computers for further analysis and reporting.

CIMOR applications development has been performed using C# .NET, which is a component of Microsoft Visual Studio .NET. Visual Studio provides Rapid Application Development (RAD) programming capabilities.[92] RAD is the term used in software lifecycle development for quickly, efficiently, and effectively developing program code while focusing on the business problem as opposed to programming intricacies. Visual Studio has a comprehensive set of programming tools for .NET web applications including the programming languages Visual Basic, Visual C++, Visual C#, and Visual J#.

C# .NET has the ability to extend the functionality of Microsoft Word and Microsoft Excel via writing programs for them. As clearly indicated by the .NET, C# can utilize the functionality available in .NET. C# .NET has the functionality built in to support mobile Web devices including mobile phones, pagers, and personal digital assistants (PDAs). There are various programmer aids that help improve programmer productivity (e.g., anticipating certain language functions and automatically supplying them). It also has the capability to use and debug SQL applications as well as to visually design tables and queries.

[92] Visual Studio .NET: "Essential Enabler" of New World of Web Services, Applications, http://www.microsoft.com/presspass/features/2002/feb02/02-08vsnet.mspx.

Appendix 5 2006 Comparison of Bond Clinical Functionality to Commission for Healthcare Information Technology (CCHIT) Functionality

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
1.	Identify and maintain a patient record: Key identifying information is stored and linked to the patient record. Both static and dynamic data elements will be maintained. A look up function uses this information to uniquely identify the patient.	1. The system shall create a single patient record for each patient.		Yes
2.		2. The system shall associate (store and link) key identifier information (e.g., system ID, medical record number) with each patient record.	Key identifier information must be unique to the patient record but may take any system defined internal or external form.	Yes
3.		3. The system shall store more than one identifier for each patient record.	For interoperability, practices need to be able to store additional patient identifiers. Examples include an ID generated by an Enterprise Master Patient Index, a health plan or insurance subscriber ID, regional and/or national patient identifiers if/when such become available.	Yes
4.		4. The system shall use key identifying information to identify (look up) the unique patient record.		Yes
5.		5. The system shall provide more than one means of identifying (looking up) a patient.	Examples of identifiers for looking up a patient include date of birth, phone number.	Yes
6.		6. The system shall provide a field which will identify patients as being exempt from reporting functions.	Examples include patients who are deceased, transferred, moved, seen as consults only. Being exempt from reporting is not the same as de-identifying a patient who will be included in reports. De-identifying patients for reporting is addressed in the "Health record output" functionality.	Yes
7.		7. The system shall provide the ability to merge patient information in a controlled method when appropriate.	If a duplicate chart is created, information could be merged into one chart.	No
8.	Manage patient demographics: Contact information including addresses and phone numbers, as well as key demographic information such as date of birth, gender, and other information is stored and maintained for reporting purposes and for the provision of care.	1. The system shall capture and maintain demographic information as part of the patient record.	Examples of a minimum set of demographic data elements include: name, address, phone number and date of birth. It is assumed that all demographic fields necessary to meet legislative and regulatory (e.g., HIPAA), research, and public health requirements will be included. A desirable feature would be a method of identifying how patients would like to be contacted (e.g., alternate addresses). De-identifying demographic information is addressed in the "Health record output" functionality.	Yes
9.		2. The system shall provide the ability to	This includes using demographics to generate	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		include demographic information in reports.	reports and also allows demographics to be gathered into a report. See also "Report generation" functionality.	
10.		3. The system shall maintain historic information for prior names and addresses.	Providers need this for look up and contact purposes, e.g., when attempting to locate a patient or family member for clinical communications.	No
11.		4. The system shall provide the ability to modify demographic information about the patient.		Yes
12.		5. The system shall store demographic information in the patient medical record in separate data fields, such that data extraction tools can retrieve these data.		No
13.	Manage problem list: Create and maintain patient specific problem lists.	1. The system shall display all current problems associated with a patient.	We assume current and active to mean the same thing.	Yes
14.		2. The system shall maintain a history of all problems associated with a patient.	This means both current and inactive and/or resolved problems. These may be viewed on separate screens or the same screen. Ideally each discrete problem would be listed once.	Yes
15.		3. The system shall provide the ability to maintain the onset date of the problem.	It is a vendor design decision whether to require complete date or free text of approximate date.	Yes
16.		4. The system shall provide the ability to record the chronicity (chronic, acute/self-limiting, etc.) of a problem.		Yes
17.		5. The system shall record the user ID and date of all updates to the problem list.		Yes
18.		6. The system shall provide the ability to associate orders, medications, and notes with one or more problems.	One should be able to identify all visits for a particular diagnosis/problem.	No
19.		7. The system shall provide the ability to maintain a coded list of problems.	For example, ICD-9, SNOMED-CT, DSMIV. The Functionality WG will not specify which code set(s) are to be employed.	Yes
20.		8. The system shall provide the ability to display inactive and/or resolved problems.		Yes
21.		9. System shall provide the ability to manually order / sort the problem list	Sorting a patient's problem list differently by provider is beyond the scope of this requirement.	No
22.	Manage medication list: Create and maintain patient specific medication lists- Please see DC.1.3.1 for medication ordering as there is some overlap.	1. The system shall create and maintain medication lists.	The medication list should be "patient-centric" and may include medications prescribed by any provider.	Yes
23.		2. The system shall record the prescribing of medications including the identity of the		Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		prescriber.		
24.		3. The system shall maintain medication ordering dates.		Yes
25.		4. The system shall maintain other dates associated with medications including start, modify, renewal and end dates as applicable.		Yes
26.		5. The system shall display medication history for the patient.	For clarification, medication history includes all medications prescribed since the EMR was established.	Yes
27.		6. The system shall capture medications entered by authorized users other than the prescriber.	It is important to have all current medications in the system for drug interaction checking. This in the future would include the incorporation of medication history obtained from outside electronic interfaces from insurers, PBMs, etc. "User" means medical and non-medical staff who are authorized by policy to enter prescriptions or other documentation.	Yes
28.		7. The system shall provide the ability to enter nonprescription medications, including over the counter and complementary medications such as vitamins, herbs and supplements.	This is important for interaction checking, associating symptoms with supplements e.g. the L-trytophan related eosinophilamyalgia syndrome	Yes
29.		8. The system shall provide the ability to exclude a medication from the current medication list (e.g., marked inactive, erroneous, completed, discontinued) and document reason for such action.	Reason for removal or discontinuation may be captured as a discrete data element or as free text. In future this should be structured.	Yes
30.		9. The system shall store medication information in discrete data fields such as dose, route, sig, dispense amount, refills, associated diagnoses, etc.	Only approved abbreviations should be included.	No
31.		10. The system shall provide the ability to print a current medication list.		Yes
32.		11. The system shall provide the ability to display current medications only.	Excluding prior medications to make current medications easier to identify. Any given medication should display only once in the list.	Yes
33.		12. The system shall include standard medication codes associated with items in the medication list.	It is anticipated that upcoming eRx regulation and the work of AHIC will define these in the near future. This requires publication by HITSP of an implementation guide by 3/06. This requirement will be postponed for a year after the publication of such a guide if one is not available by 3/06.	No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
34.		13. The system shall provide the ability to enter uncoded or free text medications when medications are not on the standard medication list or information is insufficient to completely identify the medication.	Medications that are not on the standard medication list or not enough information is available to completely identify the medication. This could be either uncoded (Synthroid unknown dose) or free text (blue hypertension pill)	No
35.		14. The system shall alert the user at the time a new medication is prescribed that drug interaction and allergy checking will not be performed against the uncoded or free text medication.		No
36.		15. The system shall provide the ability to enter or further specify in a discrete field that the patient takes no medications.		No
37.		16. The system shall capture and display the identity of the user and date of changes made to the medication list for the patient.	This information may appear as an optional view rather than a required view on the main screen.	No
38.	Manage allergy and adverse reaction list: Create and maintain patient specific allergy and adverse reaction lists.	1. The system shall capture and store lists of medications and other agents to which the patient has had an allergic or other adverse reaction.	The user determines what defines an allergy or adverse reaction.	Yes
39.		2. The system shall provide the ability to specify the type of allergic or adverse reaction.	Allergy type may be specified as a discrete data element and/or as a free text description. This should be a modifiable field.	No
40.		3. The system shall provide the ability to remove an item from the allergy and adverse reaction list.	This could include removal, marking as erroneous, or marking as inactive.	Yes
41.		4. The system shall provide the ability to specify the reason for removing an allergy/allergen from the allergy list.	Reason for removing an allergy type may be specified as a discrete data element and/or as a free text description.	No
42.		5. The system shall record the removal of items from the allergy list, including the ID of the user who removed the item and attributes of the items removed.	Necessary for medico-legal purposes	No
43.		6. The system shall provide the ability to review the allergies for a patient and record the date the review was performed and the ID of the user who performed it.	Medico-legal and regulatory compliance	No
44.		7. The system shall provide the ability to explicitly indicate that a patient has no known drug allergies.	Medico-legal and regulatory compliance. This is meant to be specific to drug allergies.	Yes
45.		8. The system shall provide the ability to		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		display information which has been removed from the list or prior information that has been modified.		
46.		9. The system shall capture non-drug agents to which the patient has had an allergic or other adverse reaction.	These could include items such as foods or environmental agents. This need not be accomplished within the same portion of the chart where medication allergies are noted.	Yes
47.	Manage patient history: Capture, review, and manage medical, procedural/surgical, social and family history including the capture of pertinent positive and negative histories, patient reported or externally available patient clinical history.	1. The system shall capture, store, display, and manage patient history.	Examples include past medical/surgical problems, diagnoses, procedures, family history and social history.	Yes
48.		2. The system shall provide the ability to capture structured data in the patient history.		No
49.		3. The system shall provide the ability to update a patient history by modifying, adding, removing, or inactivating items from the patient history as appropriate.	Requirement not predicated on the capture of structured data.	Yes
50.		4. The system shall provide the ability to capture patient history as both a presence and absence of conditions, i.e., the specification of the absence of a personal or family history of a specific diagnosis, procedure or health risk behavior.	Requirement not predicated on the capture of structured data.	No
51.		5. The system shall capture history collected from outside sources.	This could include data from a personal health record, online patient histories, and information from pharmacy benefit management organizations. This criterion will accept any method of entry for year one, but electronic entry of information will be required thereafter.	Yes
52.		6. The system shall capture patient history in a coded form.		No
53.	Summarize health record	1. The system shall create and display a summary list for each patient that includes, at a minimum, the active problem list, current medication list, medication allergies and adverse reactions	Health record summary is at the patient level as opposed to at the level of an individual visit or episode of care.	Yes
54.	Manage clinical documents and notes: Create, correct, authenticate, and close, as needed, transcribed or directly entered clinical documentation.	1. The system shall create clinical documentation or notes (henceforth "documentation").		Yes
55.		2. The system shall display documentation.		Yes
56.		3. The system shall save a note in progress		Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		prior to finalizing the note.		
57.		4. The system shall provide the ability to finalize a note, i.e., change the status of the note from in progress to complete so that any subsequent changes are recorded as such.	Medico-Legal. User rights are determined by role-based access defined in security. Only authorized users can complete, change or sign off a clinical note. The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	Yes
58.		5. The system shall record the identity of the user finalizing each note and the date and time of finalization.	Medico-Legal. User rights are determined by role-based access defined in security. Only authorized users can complete, change or sign off a clinical note. The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	Yes
59.		6. The system shall provide the ability to cosign a note and record the date and time of signature.	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	No
60.		7. The system shall provide the ability to addend and/or correct notes that have been finalized.	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
			is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	
61.		8. The system shall record and display the identity of the user who addended or corrected a note, as well as other attributes of the addenda or correction, such as the date and time of the change.	Necessary for medico-legal purposes. The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	Yes
62.		9. The system shall provide the ability to enter free text notes.		Yes
63.		10. The system shall provide the ability to filter, search or order notes by the provider who finalized the note.		Yes
64.		11. The system shall provide the ability to filter, search or order notes by associated diagnosis within a patient record.		No
65.		12. The system shall capture patient vital signs, including blood pressure, heart rate, respiratory rate, height, and weight, as discrete data.	It is understood that vendors should support conversion to numeric values that can be graphed.	Yes
66.		13. The system shall capture other clinical data elements, such as peak expiratory flow rate, size of lesions, severity of pain, as discrete data.		No
67.		14. The system shall associate standard codes with discrete data elements in a note.	Examples include but are not limited to SNOMED-CT, ICD-9CM, DSM-IV, CPT-4, MEDCIN, and LOINC. This would allow symptoms to be associated with SNOMED terms, labs with LOINC codes, etc. The code associated with a note would remain static even if the code is updated in the future.	No

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68.		15. The system shall provide templates for inputting data in a structured format as part of clinical documentation.	Codified data are data that is structured AND codified according to some 'external' industry accepted standard such as ICD-9, SNOMED-CT, and CPT-4.	Yes
69.		16. The system shall provide the ability to customize clinical templates.	Customizations may be site specific.	Yes
70.		17. The system shall provide templates for displaying medical summary data in a structured format.	Examples might include the continuity of care record or the CDA.	No
71.		18. The system shall display patient-disputed information such that a user could identify it as being disputed.	Examples include but are not limited to a different font or font color, special characters, a label, etc.	No
72.		19. The system shall link disputed information to the original entry.	This may be managed as an addendum at the document level.	Yes
73.		20. The system shall identify patient completed information.		No
74.		21. The system shall provide the ability to graph height and weight over time.		Yes
75.	Removed	1. Removed.		No
76.	Capture external clinical documents: Incorporate clinical documentation from external sources.	1. The system shall provide the ability to capture and store external documents.	Scanned documents are sufficient in 2005; granular data will be expected in the future. This covers all types of documents received by the practice that would typically be incorporated into a medical record, including but not limited to faxes, referral authorizations, consultant reports, and patient correspondence of a clinical nature.	Yes
77.		2. The system shall receive, store in the patient's record, and display discrete lab results received through an electronic interface.	This may be an external source such as a commercial lab or through an interface with on site lab equipment.	Yes
78.		3. The system shall provide the ability to save scanned documents as images.		Yes
79.		4. The system shall receive, store in the patient's record, and display text-based outside reports.	This could be either from an outside system or from scanning with optical character recognition. Integration here means the ability to find and display the documents within the system.	Yes
80.		5. The system shall provide the ability to save radiologic images, slides or other visual data as images.	Eventually the goal would be to allow linkage to outside systems such as a hospital PAC system.	No
81.		6. The system shall accept, store in the patient's record, and display clinical results	In addition to lab and radiology reports, this might include interfaces with case/disease management	No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		received through an interface with an external source.	programs and others.	
82.		7. The system shall accept, store in the patient's record, and display medication details from an external source.		No
83.		8. The system shall accept, store in the patient's record, and display structured text-based reports received from an external source.	This allows for more granular integration of data.	No
84.		9. The system shall accept, store in the patient's record, and display fully structured, codified data received from an external source.	Such as those sent from another physician using a standardized format.	No
85.	Generate and record patient specific instructions: Generate and record patient specific instructions as clinically indicated.	1. The system shall provide access to patient instructions and patient educational materials, which may reside within the system or be provided through links to external sources.	An example would be a vaccine information statement.	No
86.		2. The system shall provide access to medication instructions, which may reside within the system or be provided through links to external sources.		Yes
87.		3. The system shall provide access to test and procedure instructions that can be customized by the physician or health organization. These documents may reside within the system or be provided through links to external sources.	Patient education is not automatically documented.	No
88.		4. The system shall provide the ability to record that patient specific instructions or educational material were provided to the patient.	This does not require automatic documentation.	Yes
89.		5. The system shall provide the ability to create patient specific instructions.		Yes
90.	Order medication: Create prescriptions or other medication orders with detail adequate for correct filling and administration.	1. The system shall create prescription or other medication orders with sufficient information for correct filling and administration by a pharmacy.	The term pharmacy here refers to all entities which fill prescriptions and dispense medications including but not limited to retail pharmacies, specialty, and mail order pharmacies.	Yes
91.		2. The system shall provide the ability to set required fields to enforce generation of a complete prescription.		No

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92.		3. The system shall record user and date stamp for prescription related events, such as initial creation, renewal, refills, discontinuation, and cancellation of a prescription.	Security to limit prescription writing is included in I.1.2 below.	Yes
93.		4. The system shall capture the identity of the prescribing provider for all medication orders	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	Yes
94.		5. The system shall provide the ability to cosign medication orders	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	No
95.		6. The system shall update the medication history with the newly prescribed medications.	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	Yes
96.		7. The system shall provide a list of medications to search from, including both generic and brand name.		No
97.		8. The system shall maintain a coded list of medications.	For clarification - Coding means a unique identifier for each medication. This functional requirement	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
			does not intend to require a national system of coding for medications.	
98.		9. The system shall capture common content for prescription details including strength, sig, quantity, and refills to be selected by the ordering clinician.	We encourage the development of standard national abbreviations and that only approved abbreviations should be supported.	Yes
99.		10. The system shall check for daily dose outside of recommended range for patient age (e.g., off-label dosing).	Year to be determined once e-prescribing sig requirements have been defined.	No
100.		11. The system shall provide the ability to select a drug by therapeutic class.		No
101.		12. The system shall display and store information received through electronic prescription eligibility checking.	Will be required by e-prescribing. This criterion should maintain a record of whether the patient was eligible for coverage in the system.	No
102.		13. The system shall display and store information received through health plan/payer formulary checking.	If this included medications already on the medication list, a duplicate should not be created (same date, medication, strength, and prescriber). Formulary checking refers to whether a particular drug is covered.	No
103.		14. The system shall provide the ability to reorder a prior prescription without re-entering previous data (e.g. administration schedule, quantity).		Yes
104.		15. The system shall provide the ability to print and electronically fax prescriptions.		Yes
105.		16. The system shall provide the ability to re-print and re-fax prescriptions.	This allows a prescription that did not come out of the printer, or a fax that did not go through, to be resent / reprinted without entering another prescription. Appropriate audits and security should be in place.	Yes
106.		17. The system shall provide the ability to submit prescriptions electronically.	See also line 166 (DC 3.2.2). Faxing for 2006, tentative electronic 2007 once standards are promulgated.	No
107.		18. The system shall display a dose calculator for patient-specific dosing based on weight, age, and/or renal function.	This allows the user to enter pertinent information to calculate doses. This would be an interim step until databases are available to calculate doses automatically.	No
108.		19. The system shall display patient specific dosing recommendations based on weight, age, and renal function.	This would calculate automatically from pertinent information in the chart such as age, height, weight, creatinine and should be in standard units and based on a standard periodicity. This is contingent	No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
			upon availability of databases. We encourage their rapid development.	
109.		20. The system shall have the ability to display information about the patient's financial responsibility for the prescription.	This could include co-payments or tier level of the drug obtained through an interface with a pharmacy benefits manager (PBM).	No
110.		21. The system shall identify medication samples dispensed, including lot number and expiration date.	Lot numbers and expiration date could be entered in free text or encoded.	No
111.		22. The system shall provide the ability to prescribe fractional amounts of medication (e.g. 1/2 tsp, 1/2 tablet).	Very important to prescribing for pediatric and geriatric patients.	Yes
112.		23. The system shall provide the ability to prescribe uncoded medications.	See D.C.1.1.3.2	No
113.		24. The system shall alert the user at the time a new medication is prescribed that drug interaction, allergy, and formulary checking will not be performed against the uncoded medication.		No
114.		25. The system shall provide the ability to update drug interaction databases.	This includes updating or replacing the database with a current version.	Yes
115.		26. The system shall alert the user if the drug interaction information is outdated based on the frequency of updates.	The drug database should have a "kill date" based on the frequency of their updates such that when that date has passed, the user is alerted.	No
116.		27. System shall allow the user to configure prescriptions to incorporate fixed text according to the user's specifications and to customize the printed output of the prescription.	This refers to the "written" output and language on the prescription such as specific language, dispense as written. For instance, users should be able to modify the format/content of printed prescriptions to comply with state Board of Pharmacy requirements.	Yes
117.		28. The system shall provide the ability to associate a diagnosis with a prescription.		Yes
118.		29. The system shall provide the ability to display the problem or diagnosis (indication) on the printed prescription.	At least one diagnosis shall be able to be displayed but the ability to display more than one is desirable.	No
119.		30. The system shall provide links to general prescribing information at the point of prescribing.		No
120.		31. The system shall provide the ability to create provider specific medication lists of the most commonly prescribed drugs with a default dose, frequency, and quantity.		No
121.		32. The system shall provide the ability to add		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		reminders for necessary follow up tests based on medication prescribed.		
122.	Order diagnostic tests: Submit diagnostic test orders based on input from specific care providers.	1. The system shall provide the ability to order diagnostic tests, including labs and imaging studies.	This includes physicians and authorized non-physicians.	Yes
123.		2. The system shall provide the ability to associate a problem or diagnosis with the order.		No
124.		3. The system shall capture the identity of the ordering provider for all test orders.		Yes
125.		4. The system shall capture applicable co-signatures for all test orders.	The words, "sign," "signature," "cosign," and "cosignature" are intended here to convey actions, rather than referring to digital signature standards. It is recognized that an electronic signature is useful here. However, a widely accepted standard for electronic signatures does not exist. Thus, the criteria calls for documenting the actions of authenticated users at a minimum. In the future, when appropriate digital signature standards are available, certification criteria may be introduced using such standards.	No
126.		5. The system shall capture appropriate order entry detail, including associated diagnosis.	Including associated diagnoses. It is desirable that all information for medical necessity checking be captured.	Yes
127.		6. The system shall provide instructions and/or prompts to the ordering user when placing orders for diagnostic tests so that the user supplies all required information.		No
128.		7. The system shall relay orders for a diagnostic test to the correct destination for completion.	Mechanisms for relaying orders may include providing a view of the order, sending it electronically, or printing a copy of the order or order requisition.	Yes
129.		8. The system shall provide a view of active orders for an individual patient.	Additional sorts and filters may be provided by the vendors but not required.	No
130.		9. The system shall provide a view of orders by like or comparable type, e.g., all radiology or all lab orders.		No
131.	Manage order sets: Provide order sets based on provider input or system prompt, medication suggestions, drug recall updates.	1. The system shall provide the ability to define a set of related orders to be subsequently ordered as a group on multiple occasions.		No

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132.		2. The system shall provide the ability to modify order sets.		No
133.		3. The system shall provide the ability to include in an order set orders for medications, laboratory tests, imaging studies, procedures and referrals.		No
134.		4. The system shall provide the ability to display orders placed through an order set either individually or as a group.		No
135.		5. The system shall provide the ability for individual items in an order set to be selected or deselected.		No
136.	Manage results: Route, manage, and present current and historical test results to appropriate clinical personnel for review, with the ability to filter and compare results.	1. The system shall indicate normal and abnormal results based on data provided from the original data source.	As each lab has its own normal values, these should be reflected in the indication as to whether a lab is normal or abnormal.	Yes
137.		2. The system shall display numerical results in flow sheets and graphical form in order to compare results.	It is desirable for the system indicate if abnormal results are high or low.	No
138.		3. The system shall display non-numeric current and historical test results as textual data.		Yes
139.		4. The system shall notify the relevant providers (ordering, copy to) that new results have been received.	Examples of notifying the provider include a reference to the new result in a provider "to do" list or inbox	No
140.		5. The system shall filter or sort results by patient, type of test, and date.	Needed for pay for performance.	No
141.		6. The system shall provide the ability to forward a result to other users.		No
142.		7. The system shall provide the ability to transfer the responsibility to perform follow up actions from clinical to other clinical personnel.		No
143.		8. The system shall link the results to the original order.	This would include changing the status of orders from pending to completed.	No
144.		9. The system shall provide the ability to enter a free text annotation to a result.		No
145.		10. The system shall provide the ability to associate one or more images with a result.	Through direct storage or links to the data.	No
146.		11. The system shall provide the ability for a	This is separate from audit trail.	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		user to whom a result is presented to acknowledge the result.		
147.	Manage consents and authorizations: Create, maintain, and verify patient treatment decisions in the form of consents and authorizations when required.	1. The system shall capture scanned paper consent documents (covered in DC 1.1.7).		Yes
148.		2. The system shall generate both on-line and printable consent forms.	Example: Consent forms stored in the computer which are capable of being signed by the patient with either an electronic pen or a digital signature once widely available.	No
149.		3. The system shall store and display administrative authorizations (e.g. privacy notices).	Needed for HIPAA. Scanned copy is acceptable for 2005.	No
150.		4. The system shall store and display authorizations associated with a specific clinical activity (e.g., treatment, surgery) along with that event in the patient's electronic chart.		No
151.		5. The system shall provide the ability to chronologically display consents and authorizations.		No
152.	Manage patient advance directives: Capture, maintain, and provide access to patient advance directives.	1. The system shall provide the ability to indicate that a patient has completed advanced directive(s).	Important for appropriate use of resources at end of life and may just include a yes, no indication	Yes
153.		2. The system shall provide the ability to indicate the type of advanced directives, such as living will, durable power of attorney, or a "Do Not Resuscitate" order.		No
154.		3. The system shall provide the ability to indicate when advanced directives were last reviewed.		No
155.	Support for standard care plans, guidelines, protocols: Support the use of appropriate standard care plans, guidelines, and/or protocols for the management of specific conditions.	1. The system shall provide access to standard care plan, protocol and guideline documents when requested at the time of the clinical encounter. These documents may reside within the system or be provided through links to external sources.	This requirement could be met by simply including links or access to a text document. Road map would require more comprehensive decision support in the future. This includes the use of clinical trial protocols to ensure compliance.	Yes
156.		2. The system shall provide the ability to create site specific care plan, protocol, and guideline documents.	This includes the use of clinical trial protocols to ensure compliance. It is expected that in the future discrete data elements from other areas of the chart will populate matching fields.	Yes
157.		3. The system shall provide the ability to modify site specific standard care plan,		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		protocol, and guideline documents obtained from outside sources.		
158.	Capture variances from standard care plans, guidelines, protocols: Identify variances from patient specific and standard care plans, guidelines, and protocols.	1. The system shall provide the ability to record variances from care plans, guidelines, and protocols.	For 2005 certification, this requirement is fulfilled by line 46 (creation of notes). We anticipate that in the future there would be a requirement to capture this as structured data. We encourage standardization of performance measures on the national level.	No
159.		2. The system shall provide the ability to record the reason for variation from care plans, guidelines, and protocols.	Needed for pay for performance.	No
160.	Support for drug interaction: Identify drug interaction warnings at the point of medication ordering	1. The system shall check for potential interactions between medications to be prescribed and current medications and alert the user at the time of medication ordering if potential interactions exist.	This reduces risk of inappropriate prescribing, prevents pharmacy call backs, and can reduce malpractice liability.	Yes
161.		2. The system shall check for potential interactions between medications to be prescribed and medication allergies and intolerances listed in the record and alert the user at the time of medication ordering if potential interactions exist.		Yes
162.		3. The system shall provide the ability to prescribe a medication despite alerts for interactions and/or allergies being present.		Yes
163.		4. The system shall provide the ability to set the severity level at which drug interaction warnings should be displayed.		Yes
164.		5. The system shall check for duplicate therapies by pharmaceutical class and alert the user at the time of medication ordering if such exist.	This can be based on proprietary data schemes for 2006.	No
165.		6. The system shall provide the ability to document reasons for overriding a drug interaction warning.	Necessary for medico-legal purposes.	No
166.		7. The system shall provide alerts indicating to the prescriber that certain lab test results may be impacted by a patient's medications.		No
167.		8. The system shall provide the ability to check whether a medication being prescribed has been noted to be ineffective for the patient in the past, and	This criterion enables the user to indicate if a medication was ineffective when the medication was discontinued.	No

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		alert the user at the time of medication ordering if noted ineffectiveness exists.		
168.		9. The system shall provide the ability to display, on demand, potential interactions on a patient's medication list, even if a medication is not being prescribed at the time.		No
169.		10. The system shall provide drug-disease interaction alerts.	Within the limitations of available databases.	No
170.		11. The system shall provide the ability to view the rationale for a drug interaction alert.	Drug reference information typically provided by drug database vendors is an example of the source to obtain the rationale.	No
171.		12. The system shall provide the ability to check for potential interactions between a current medication and a newly entered allergy.		No
172.		13. The system shall generate alerts based on patient age.	This could be based on user defined medication lists or on standard lists such as the Beers lists.	No
173.	Support for medication or immunization administration or supply: To reduce medication errors at the time of administration of a medication, the patient is positively identified; checks on the drug, the dose, the route and the time are facilitated. Documentation is a byproduct of this checking; administration details and additional patient information, such as injection site, vital signs, and pain assessments, are captured. In addition, access to online drug monograph information allows providers to check details about a drug and enhances patient education.	1. The system shall provide the ability to document medication administration.		Yes
174.		2. The system shall provide the ability to document immunization administration.		Yes
175.		3. The system shall document immunization, dose, time, route, site, lot number, expiration date, manufacturer, and user ID as structured documentation.	Capturing this information for non immunizations is optional.	No
176.		4. The system shall provide the ability to indicate a reaction to a specific immunization administration.	Immunization allergies may be indicated in the Allergy section.	No
177.		5. The system shall alert a user at the time of ordering that the patient had a prior adverse reaction to that immunization.		No
178.	Support for non-medication ordering (referrals, care management)	1. The system shall create referral orders with detail adequate for correct routing.	This could include referrals to subspecialists, physical therapy, speech therapy, nutritionists, and other non-medication, non-clinical order.	No
179.		2. The system shall record user ID and date/time stamp for all referral related events.	Necessary for medico-legal purposes.	No
180.	Present alerts for disease management, preventive services and	1. The system shall provide the ability to establish criteria for disease management,	This includes the use of clinical trial protocols to ensure compliance.	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
	wellness: At the point of clinical decision making, identify patient specific suggestions/reminders, screening tests/exams, and other preventive services in support of disease management, routine preventive and wellness patient care standards.	wellness, and preventive services based on patient demographic data (minimally age and gender).		
181.		2. The system shall display alerts based on established guidelines.	Guidelines may be from national organizations, payers, or internal protocols. It is expected that in the future discrete data elements from other areas of the chart will populate matching fields. It is assumed that when a service is completed, this change will be immediately reflected with removal of the prompt.	Yes
182.		3. The system shall provide the ability to establish criteria for disease management, wellness, and preventive services based on clinical data (problem list, current medications).	Lab results in future years	Yes
183.		4. The system shall provide the ability to update disease management guidelines and associated reference material.	This allows the system's decision support tools to support changes in best practice guidelines.	Yes
184.		5. The system shall provide the ability to update preventive services/wellness guidelines and associated reference material.		Yes
185.		6. The system shall provide the ability to override guidelines.		Yes
186.		7. The system shall provide the ability to document reasons disease management or preventive services/wellness prompts were overridden.	Needed for some pay for performance initiatives.	No
187.		8. The system shall provide the ability to modify the guidelines.	This is necessary for modifications as guidelines change or practices wish to adhere to more stringent levels for example, using an HbA1c target of 6.5% instead of 7%.	No
188.		9. The system shall provide the ability to document that a preventive or disease management service has been performed based on activities documented in the record (e.g., vitals signs taken).		No
189.		10. The system shall provide the ability to document that a disease management or preventive service has been performed with associated dates or other relevant details recorded.	This could include services performed internally or external to the practice.	No

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		11. The system shall provide the ability to be customized to address specific patient situations.	For example - remove mammography for woman that has had a mastectomy	
190.	Notifications and reminders for disease management, preventive services and wellness: Between healthcare encounters, notify the patient and/or appropriate provider of those preventive services, tests, or behavioral actions that are due or overdue.	1. The system shall identify preventive services, tests, or counseling that are due on an individual patient.	In the future, the system should perform this automatically and proactively "contact" patient(s) without physician intervention (e.g. automated reminder letter). These guidelines might come from national organizations, medical societies, etc.	Yes
191.		2. The system shall display reminders for disease management, preventive, and wellness services in the patient record.	It is expected that in the future discrete data elements from other areas of the chart will populate matching fields.	Yes
192.		3. The system shall provide the ability to identify criteria for disease management, preventive, and wellness services based on patient demographic data (age, gender).		Yes
193.		4. The system shall provide the ability to identify criteria for disease management, preventive, and wellness services based on clinical data (problem list, current medications, lab values).	These guidelines could be tailored to address payer-specific criteria but we would encourage national standardization of guidelines.	No
194.		5. The system shall provide the ability to modify the guidelines that trigger the reminders.		Yes
195.		6. The system shall provide the ability to notify the provider that patients are due or are overdue for disease management, preventive, or wellness services.		Yes
196.		7. The system shall provide the ability to produce a list of patients who are due or are overdue for disease management, preventive, or wellness services.		Yes
197.		8. The system shall send an electronic reminder to the patient of services that are due.	Reminders that include PHI must be delivered through HIPAA-compliant means.	No
198.	Clinical task assignment and routing: Assignment, delegation and/or transmission of tasks to the appropriate parties.	1. The system shall provide the ability to create and assign tasks by user or user role.	Examples of tasks are messages, notifications, inbox items, worklist to-do's. This task assignment refers to internal users. External tasks would be handled under ordering section.	Yes
199.		2. The system shall provide the ability to present a list of tasks by user or user role.		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
200.		3. The system shall provide the ability to re-assign and route tasks from one user to another user.		No
201.		4. The system shall provide the ability to designate a task as completed.		Yes
202.		5. The system shall provide the ability to remove a task without completing the task.	Removing a task eliminates it from an individual user's "to do" list, not from audit logs, etc.	Yes
203.		6. The system shall provide the ability to escalate incomplete tasks to the appropriate supervisor or authority.	Escalation can be based on elapsed time or other criteria.	No
204.	Inter-provider communication: Support secure electronic communication (inbound and outbound) between providers in the same practice to trigger or respond to pertinent actions in the care process (including referral), document non-electronic communication (such as phone calls, correspondence or other encounters) and generate paper message artifacts where appropriate.	1. The system shall provide the ability to document verbal/telephone communication into the patient record.		Yes
205.		2. The system shall provide the ability to incorporate paper documents from external providers into the patient record.		Yes
206.		3. The system shall support messaging between users.	Results and other patient data could be included. As clarification, messaging is defined as any text string sent from one person to another in the office.	Yes
207.	Pharmacy communication: Provide features to enable secure and reliable communication of information electronically between practitioners and pharmacies or between practitioner and intended recipient of pharmacy orders.	1. The system shall provide electronic communication between prescribers and pharmacies or other intended recipients of the medication order.	Until electronic standards are established, FAX is a suitable means of transmission.	Yes
208.		2. The system shall electronically communicate from the prescriber to the pharmacy an initial medication order as well as changes to or renewals of an existing order.	Cancellations would be included in this function.	No
209.		3. The system shall capture any acknowledgments, prior authorizations, renewals, inquiries and fill notifications provided by the pharmacy or other participants in the electronic prescription.		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
210.	Provider demographics: Provide a current directory of practitioners that, in addition to demographic information, contains data needed to determine levels of access required by the EHR security and to support the practice of medicine.	1. The system shall maintain a directory of all clinical personnel who currently use or access the system.		Yes
211.		2. The system shall maintain a directory which contains identifiers required for licensed clinicians to support the practice of medicine including at a minimum state medical license, DEA, NPI, and UPIN number.	This directory may be the same as that in criteria #1 for this functionality.	Yes
212.		3. The system shall maintain a directory that stores user attributes required to determine the system security level to be granted to each user.	This directory may be the same as that in criteria #1 for this functionality.	Yes
213.		4. The system shall allow authorized users to update the directory.		Yes
214.		5. The system shall maintain a directory of clinical personnel external to the organization who are not users of the system to facilitate communication and information exchange.	This directory may be the same as that in criteria #1 for this functionality.	No
215.	Scheduling: Support interactions with other systems, applications, and modules to provide the necessary data to a scheduling system for optimal efficiency in the scheduling of patient care, for either the patient or a resource/device.	1. The system shall display a schedule of patient appointments, populated either through data entry in the system itself or through an external application interoperating with the system.		Yes
216.	Report Generation: Provide report generation features for the generation of standard and ad hoc reports	1. The system shall provide the ability to generate reports of clinical and administrative data using either internal or external reporting tools.	Needed for pay for performance, quality improvement activities. All data that is entered in a structured format should be individually reportable.	Yes
217.		2. The system shall provide the ability to generate reports consisting of all or part of an individual patient's medical record (e.g. patient summary).	Report format may be plain text.	Yes
218.		3. The system shall provide the ability to generate reports regarding multiple patients (e.g. diabetes roster).	Any disease registry might be included.	No
219.		4. The system shall provide the ability to specify report parameters (sort and filter criteria) based on patient demographic and clinical data (e.g., all male patients over 50		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		that are diabetic and have a HbA1c value of over 7.0 or that are on a certain medication).		
220.		5. The system shall provide the ability to access reports outside the EHR application.	For example, printed output, export to a file, etc.	Yes
221.		6. The system shall provide the ability to produce reports based on the absence of a clinical data element (e.g., a lab test has not been performed or a blood pressure has not been measured in the last year).		No
222.		7. The system shall provide the ability to save report parameters for generating subsequent reports.		No
223.		8. The system shall provide the ability to modify one or more parameters of a saved report specification when generating a report using that specification.		No
224.	Health record output: Allow users to define the records and/or reports that are considered the formal health record for disclosure purposes, and provide a mechanism for both chronological and specified record element output.	1. The system shall provide the ability to define one or more reports as the formal health record for disclosure purposes.	This allows the practice to not print demographics, certain confidential sections, or other items. Report format may be plain text initially. In the future there will be a need for structured reports as interoperability standards evolve.	No
225.		2. The system shall provide the ability to generate hardcopy or electronic output of part or all of the individual patient's medical record.	This could include but is not limited to the ability to generate standardized reports needed for work, school, or athletic participation.	Yes
226.		3. The system shall provide the ability to generate hardcopy and electronic output by activities and events on a chosen date and/or date range (e.g., all hospital discharge summaries).		No
227.		4. The system shall provide the ability to de-identify protected health information (PHI) on the hardcopy and electronic output, but leave the actual PHI data unmodified in the original record.	De-identifying data on hardcopy or electronic output is necessary for research. However, it must be emphasized that this function is not intended to cleanse the text in the note or data in the original record.	No
228.		5. The system shall create hardcopy and electronic report summary information (procedures, medications, labs, immunizations, allergies, and vital signs).	The report that's produced should be organized by section to make it easier to read.	Yes
229.		6. The system shall provide support for	This criterion may be satisfied by providing the ability	Yes

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		disclosure management in compliance with HIPAA and applicable law.	to create a note in the patient's record. More advanced functionality may be market differentiators or requirements in later years.	
230.	Encounter management: Manage and document the health care delivered during an encounter.	1. The system shall provide the ability to document a patient encounter.		Yes
231.		2. The system shall provide the ability to document encounters by one or more of the following means: direct keyboard entry of text; structured data entry utilizing templates, forms, pick lists or macro substitution; dictation with subsequent transcription of voice to text, either manually or via voice recognition system.	This does not preclude entry via new technologies.	Yes
232.		3. The system shall provide the ability to associate individual encounters with diagnoses.		Yes
233.		4. The system shall provide filtered displays of encounters based on encounter characteristics, including date of service, encounter provider and associated diagnosis.		No
234.	Rules-driven financial and administrative coding assistance: Provide financial and administrative coding assistance based on the structured data available in the encounter documentation.	1. The system shall provide a list of financial and administrative codes.	For example, ICD-9 and CPT-4 codes.	Yes
235.		2. The system shall provide the ability to select an appropriate CPT Evaluation and Management code based on data found in a clinical encounter.	May be accomplished via a link to another application.	Yes
236.		3. The system shall provide assistance in selecting appropriate billing codes based on codified clinical information in the encounter.	This would be automatic and internal to the system.	No
237.		4. The system shall prompt for data required to determine appropriate administrative (evaluation & management) codes if such data is not present in encounter data.		No
238.	Eligibility verification and determination of coverage	1. The system shall display medical eligibility obtained from patient's insurance carrier, populated either through data entry in the system itself or through an external application interoperating with the system.	The EHR need only provide information for the physician as to what is or isn't covered. May be accomplished through an interface or link to a referral management application or module.	No
239.		2. The system shall store and display information received through electronic	Will be required by e-prescribing	No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
		prescription eligibility checking.		
240.	Manage Practitioner/Patient relationships: Identify relationships among providers treating a single patient, and provide the ability to manage patient lists assigned to a particular provider.	1. The system shall identify by name all providers associated with a specific patient encounter.	A provider is defined as anyone delivering clinical care such as physicians, PAs, CNPs and nurses; the provider is the person who completes the note.	Yes
241.		2. The system shall provide the ability to specify the role of each provider associated with a patient, such as encounter provider, primary care provider, attending, resident, or consultant.	This is simply meant as a means to define the provider role. Display of that data is not addressed.	No
242.		3. The system shall provide the ability to specify the primary or principal provider responsible for the care of a patient within a care setting.		No
243.		4. The system shall create a list of all patients who have had an encounter with a given provider.		No
244.	Clinical decision support system guidelines updates: Receive and validate formatted inbound communications to facilitate updating of clinical decision support system guidelines and associated reference material	1. The system shall provide the ability to update the clinical content or rules utilized to generate clinical decision support reminders and alerts.	Growth charts, CPT-4 codes, drug interactions would be an example. Any method of updating would be acceptable. Content could be third part or customer created.	Yes
245.		2. The system shall provide the ability to update clinical decision support guidelines and associated reference material.	Any method of updating would be acceptable. Content could be third part or customer created.	Yes
246.	Entity Authorization: Manage the sets of access control permissions granted to entities that use an EHRS. Enable EHR-S security administrators to grant authorizations to users for roles, and within contexts. A combination of the authorization levels may be applied to control access to EHR-S functions or data within an EHR-S, including at the application or the OS level.	1. The system shall provide the ability to designate certain note types, medications, tests, etc. as confidential and only make those values accessible by appropriately authorized users.	This allows the system administrator to designate individual tests as viewable or not by designated users	No
247.	Enforcement of confidentiality: Enforce the applicable jurisdiction's patient privacy rules as they apply to various parts of an EHR-S through the implementation of security mechanisms.	1. The system shall audit the date/time and user of each instance when a patient chart is printed		No
248.		2. The system shall provide the ability for the patient to review, and for patient-disputed information to be documented in, the chart.	This does not imply that the patient can document directly in their chart. Some methods include but are not limited to allowing the patient a view only access to their record, printing a copy of the record for a patient to review. Methods to include the information in the chart could be as a note, a scanned copy of	No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
			patient comments, an addendum to the note or other method not described.	
249.		3. The system shall identify all users who have accessed an individual's chart over a given time period.		No
250.		4. The system shall provide the ability to identify certain information as confidential and only make that accessible by appropriately authorized users.	This may be implemented by having a "confidential" section of the chart	No
251.		5. The system shall provide the ability to prevent specified user(s) from accessing a designated patient's chart	An example would be preventing access to a VIP or staff member's chart. When access is restricted, the system shall provide a means for appropriately authorized users to "break the glass" for emergency situations. Such overrides should be audited.	No
252.	Data retention, availability, and destruction: Retain, ensure availability, and destroy health record information according to organizational standards. This includes: Retaining all EHR-S data and clinical documents for the time period designated by policy or legal requirement; Retaining inbound documents as originally received (unaltered); Ensuring availability of information for the legally prescribed period of time; and Providing the ability to destroy EHR data/records in a systematic way according to policy and after the legally prescribed retention period.	1. The system shall retain data until otherwise purged, deleted, archived or otherwise deliberately removed.		Yes
253.		2. The system shall provide a method for archiving health record information.		No
254.		3. The system shall provide the ability to support retention periods as determined by applicable local, state or federal requirements.		No
255.	Audit trail: Provide audit trail capabilities for resource access and usage indicating the author, the modification (where pertinent), and the date and time at which a record was created, modified, viewed, extracted, or removed. Audit trails extend to information exchange and to audit of consent status management (to support DC.1.5.1) and to entity authentication attempts. Audit functionality includes the ability to generate audit reports and to	1. The system shall provide the ability to audit information exchange.	This includes the use of electronic data interchange such as submitting claims.	No
256.		2. The system shall audit the receipt of documents.		No

Line #	Functionality (Category and Description)	Specific Criteria	Discussion / Comments	Bond Clinician HER Function
	interactively view change history for individual health records or for an EHR-system.			
257.	Extraction of health record information: Manage data extraction in accordance with analysis and reporting requirements. The extracted data may require use of more than one application and it may be pre-processed (for example, by being de-identified) before transmission. Data extractions may be used to exchange data and provide reports for primary and ancillary purposes.	1. The system shall provide the ability to export (extract) pre-defined set(s) of data out of the system	For example, export of performance measures, ability to query data base, chronic disease management tools.	Yes
258.		2. The system shall provide the ability to import data into the system		No
259.		3. The system shall provide the ability remove discrete patient identifiers.	De-identification is necessary for research purposes, e.g., to identify patterns of disease. External applications can be used to meet these criteria.	No
260.		4. The system shall provide the ability to track the intended destination of the extracted information.	The user may indicate to whom they are sending results. The lack of control of information once it leaves the practice is acknowledged.	No
261.	Concurrent Use: EHR system supports multiple concurrent physicians through application, OS and database.	1. The system shall provide the ability for multiple users to interact concurrently with the EHR application.		Yes
262.		2. The system shall provide the ability for concurrent users to simultaneously view the same record.		Yes
263.		3. The system shall provide the ability for concurrent users to view the same clinical documentation or template.		Yes
264.		4. The system shall provide record level protection to maintain the integrity of clinical data.	To prevent users from simultaneously attempting to update a record with resultant loss of data	Yes

Appendix 6 MEDITECH's Integrated HCIS Functions[93] [94]

Line #	Component	Overview	Function	Description
1.	Physician Care Manager	Physician Care Manager enables physicians to manage patient populations through a single, easy-to-use desktop portal. Physicians direct care for patient in a hospital, emergency room, clinics, and offices (when combined with the Medical and Practice Management product).	2. Physician Desktop	The Physician Care Manager product displays the information physicians need on an electronic dashboard, so physicians have one destination from which they access information within the MEDITECH Health Care Information System. Through this desktop, physicians can manage their workloads, review patients' results, manage orders, document care, and electronically sign documents.
2.			3. Patient-Specific Care Records	The Physician Care Manager includes both quick clinical review panels of information collected during a patient's current visit, as well as comprehensive electronic records for physicians' patients. Records provide information from visits conducted anywhere within the organization's continuum of care. This could include hospitals, emergency departments, physicians' offices, home health agencies, long-term care and behavioral health facilities, and satellite laboratories. Patients' electronic records are updated automatically when new results and visit information are entered. Physicians have direct access to patient-specific: • Problem Lists • Progress Notes • Current care results, diagnostic results, medications, documentation, orders, and reports • Previous visit information with abstracts and demographic information • Medical histories, including allergies, occupations, and social histories • Care information from outpatient services • Demographics, insurance, diagnostic, and procedural code assignments • Graphs to display trends and abnormalities.
3.			4. Computerized Physician Order Entry (CPOE)	Physicians enter and manage orders from the hospital, home, or while traveling. Capabilities from throughout the MEDITECH HCIS are integrated to ensure a coordinated and safe ordering process. Pharmacists, nurses, laboratory and radiology technicians, and the rest of the care team are all tied into the physician-initiated process. What's more, physicians can sign any verbal orders and view results from wherever they may be. The order management process is integrated with the Pharmacy to instantly compare formulary data against a patient's record during the clinical decision making process. Patient and drug information is presented to the physician at the time of ordering, thereby assisting with safety and efficiency. Decision support rules and physician preferences are embedded in the ordering process. Orders automatically appear on

[93] MEDITECH Product Information, http://www.meditech.com/PublicRelations/pages/product.htm.
[94] This table's contents are for the most part copied directly from MEDITECH's webpages.

Line #	Component	Overview	Function	Description
				nurses' patient status boards. The Physician Care Manager's CPOE component includes: • Order sets based on physician preferences • Drug information from hospital formulary services • Dose checking, dose calculator, conflict checking • Duplicate order checks • Patient's allergies, adverse reactions, medication checks • Relevant clinical information such as vitals and test results • Historical patient information • Support for organization's standards of care and safety initiatives • Direct link to MAR to update the patient's record.
4.			5. Ordering Ambulatory Prescriptions and other Services	Physician Care Manager provides physicians with the ability to generate discharge orders for Emergency Department patients as well as those admitted to the hospital as inpatients. Physicians can manage prescriptions, follow-ups and diagnostics, durable medical equipment, and other orders for Emergency Department patients in the same manner by which they manage inpatient orders. Physicians furthermore are able to automatically convert inpatient orders to ambulatory orders, and likewise convert ambulatory orders to inpatient orders.
5.			6. Physician Documentation	The Physician Care Manager includes a comprehensive set of features for documenting the care patients receive. These documentation features complement the similar functions our Medical and Practice Management suite provides for documenting care provided during office visits. Physicians are able to generate notes either by storing dictations, entering comments via voice recognition software, or by typing. The documentation component enables physicians to quickly highlight key results in patients' records and include these results in care notes. Physicians furthermore are able to pre-define templates of results to be included in patients' progress notes.
6.			7. Internet Access	With MEDITECH's support of three-tier solutions such as Windows Terminal Services and Citrix, physicians have fast, secure access to Physician Care Manager from office and home, as well as from the hospital. For those occasions when physicians are traveling, MEDITECH provides secure, browser-based access to their patients' records from public Internet access.
7.			8. Order Entry (non-Physician staff)	Please note that in addition to a streamlined CPOE function tailored for physicians (described above), the Physician Care Manager product may be licensed with software to provide a comprehensive order management process for nurses and ward clerks as well. Embedded rules-based logic routines assist the process and flag dangerous and unusual values. Clerks can enter verbal or phone orders from physicians, and later get the order signed using the Electronic Signature capability.
8.			9. Optional Access to	MEDITECH's Physician Care Manager product is designed to work seamlessly with

Line #	Component	Overview	Function	Description
			Office Patients	the Medical and Practice Management suite available for physicians' offices. For example, physicians are able to access patient charts and manage care for office and clinic patients directly through the Physician Desktop when the Physician Care Manager product is combined with the Medical and Practice Management product.
9.	Medical and Practice Management (MPM) Suite	The evolution of MEDITECH's physicians' practice solution continues with the new Medical and Practice Management Suite. This product suite serves clinicians and administrative staff in practices and clinics, and includes scheduling, registration, electronic records, open item billing (electronic claim submission and remittance), and statistical and reimbursement reporting to fully automate physician practices and clinics. Seamless integration with the MEDITECH enterprise HCIS is inherent in the MPM Suite's design. Executives in health care enterprises and other larger organizations can integrate physician practices and clinics within their organizations to provide a patient-centric approach to managing patients' health care across the continuum, providing benefits to patients, physicians, and organizations. Clinics and physicians whose practices are affiliated with the enterprise can electronically manage clinical and administrative activities for more efficient practice and care delivery.	1. Provider Workload Management (PWM)	The Physicians Desktop is the provider's primary point of access to patient record data, presenting an intuitive user interface to match a provider's workflow. Users can access all components of the Medical and Practice Management (MPM) Suite, as well as inpatient data in MEDITECH's Physician Care Manager (PCM) product through this desktop when the complementary MPM and PCM products are used in combination. From here, physicians may access their office schedules, manage their prioritized tasks, review lab and radiology results, process patient correspondence and electronically sign completed documentation. They can also easily move from any portion of the MPM Suite to their desktops.
10.				**Physicians Desktop** The desktop consolidates and organizes all of the components and functions of the MPM Suite, providing a single entry point. In addition, physicians use a single sign-on to access all information within the suite. From the desktop, a physician may review results, place orders, dictate notes and electronically sign reports, notes, orders, etc. Furthermore, physicians can sign verbal orders and view results from wherever they may be — the hospital, the office, home or travel.
11.				**Workload Management** The Physicians Desktop has been designed to help physicians prioritize and streamline their daily workflow process. The Workload Management tool utilizes “push technology” to notify the provider of critical test results and other items requiring immediate attention. Workload Management also allows physicians to effectively manage daily tasks including: • Common screen to review and sign multiple medical records • Task list to organize and prioritize prescription renewals, lab orders & results, clinical notes, etc. • Concise, personalized physician schedule • Direct access point to the Electronic Ambulatory Record (EAR) and Ambulatory Order Management (AOM).
12.				**Clinical Messaging** Workload Management provides medical staff with a simple and intuitive tool for sending messages related to patient care. The messaging tool allows the user to prioritize and direct specific tasks such as: • (Re)scheduling patients • Renewing prescriptions • Processing patient calls. The messaging tool is fully integrated with the patient’s Electronic Ambulatory Record. Therefore, each time a message is sent, a note is attached to the patient’s record.

Line #	Component	Overview	Function	Description
13.				**Optional Access to Hospital Inpatients** Physicians may access records and manage care for hospital patients directly through the Physicians Desktop when the Medical and Practice Management Suite is combined with MEDITECH's Physician Care Manager (PCM) product. • Allowing the provider to review and sign both inpatient and outpatient medical records from a common screen • Providing the physician with a complete schedule including inpatient rounds and outpatient visits • Prioritizing notification of abnormal test results for both hospital and clinic patients.
14.			2. Electronic Ambulatory Record (EAR)	The Electronic Ambulatory Record (EAR) is an on-line patient clinical record that includes the ability to maintain an ongoing, patient-specific medical problem list. From one logically-designed and easy-to-use screen, health care providers can quickly view a detailed profile of the patient, including his or her current medical problems and pertinent medical information. With a quick click of the mouse, full details of visits and their associated data are accessed. In addition, EAR facilitates patient management for on-call and covering providers, allowing access to patients' ambulatory records across the practice and enabling users to quickly familiarize themselves with patients not regularly under their care.
15.				**Physicians Desktop & Workload Management** The Physicians Desktop and Workload Management system is the provider's primary point of access to patient record data, presenting an intuitive user interface to match a provider's workflow. From here, providers may access their office schedule, manage their prioritized tasks, review lab and radiology results, process patient correspondence, and electronically sign completed documentation. They can also easily move to any portion of the MPM Suite from their desktop.
16.				**Flexible Data Entry** The MPM Suite provides an electronic patient record solution with medical problem list functionality that doesn't require a huge investment in training time, or a lengthening of the encounter process. Realizing that providers have already developed workflow patterns that make sense for their practices, MPM offers flexible clinical data collection options. Those providers who prefer a paper-based system can maintain their existing workflow process utilizing the Electronic Ambulatory Record's "Intelligent" Encounter Forms -- patient-specific encounter forms that help providers efficiently review a patient's medical problems and notate encounter activity for data entry following the visit. Providers who wish to enter information directly on-line (using, for example, a wireless device in the exam room) will find the system very easy to use, and will benefit from on-line tools such as drug-drug interaction and drug-allergy checking during prescription entry. Either way, providers benefit from the collection of powerful clinical data and the automatic production of patient statements and insurance claims.
17.				**Health Maintenance Features** The Electronic Ambulatory Record features automated health maintenance alerts that appear when scheduling patient visits or viewing clinical information. In addition to

Line #	Component	Overview	Function	Description
				standard health maintenance items, such as mammograms and immunizations, health maintenance sets (such as a diabetic workup set) can be added to patient records for disease management, ensuring that patients receive proper follow-up care. In addition, EAR is equipped with an integrated messaging tool which allows notes to be attached to patient records each time a message is sent.
18.				**Care Documentation** EAR has extensive capabilities for automatically generating text as patient visits are processed. Customer-defined screens are designed according to site-specific preferences and are used to document data related to the patient's chief complaint, review of systems, and exam. This data is used to create provider-specific, formatted progress notes, resulting in greatly reduced transcription costs. In addition, providers may choose to dictate progress notes or utilize voice recognition.
19.				**Unified Clinical and Billing Functionality** The MPM Suite takes a bold new approach to physician billing and practice management by unifying clinical and billing functions while streamlining the data collection process. The Electronic Ambulatory Record automatically creates the patient bill during the collection of clinical data, eliminating the need for redundant entry of billing data by seamlessly passing billing information directly to the Physician Billing & Receivables (PBR) component.
20.				**Seamless Integration** EAR is seamlessly integrated with MEDITECH's HCIS, allowing patient clinical data to be safely and securely shared across your enterprise according to your needs. This integration benefits not only clinicians and health care organizations, but ultimately patients as well by creating rich, detailed, enterprise-accessible patient records that ensure quality of care across the care continuum. Available integration options include: • Enterprise Medical Record • Shared Demographics • Enterprise Medication & Allergy Lists • Order Entry Laboratory & Radiology.
21.				**Fully Internet Ready** One of the major obstacles to providing Web access for authorized physicians, and selective access to patients, has been the lack of a centralized, organized, and meaningful presentation of a patient's medical data. With the Electronic Ambulatory Record and MEDITECH's Internet tools, your facility can offer providers and/or patients secure access to useful, patient-specific clinical and billing data.
22.			3. Ambulatory Order Management (AOM)	The Ambulatory Order Management application provides physicians and medical practice staff the ability to manage the needs of outpatients in an efficient, easy-to-use electronic format. As part of the Medical and Practice Management (MPM) Suite, Ambulatory Order Management fits seamlessly into an organization's Health Care Information System and contributes to an effectively managed private physician

Line #	Component	Overview	Function	Description
				practice.
23.				**Expanded Order Management** Ambulatory Order Management extends physicians' capabilities beyond the standard monitoring of patient medications and enables them to enter diagnoses, referrals, and durable medical equipment orders into the system. In addition, authorized office staff members have the ability to enter orders on a pending basis until the appropriate physician reviews and approves the entry. Physicians can initiate the prescription-order process electronically and document any diagnostic procedures. In addition, users can perform drug look-ups by type, view drug monographs, and view any details pertaining to a specific medication. Any information associated with a prescription — such as renewals, changes, and special instructions — is also made available to the user. Physicians have the ability to adjust medication frequency, quantity, and refill times, and the system can process drug-drug interaction checks. Any warnings or alerts will be displayed in the medical record. Users can establish patient-specific diagnostic procedures for ordering services such as X-rays or EKG tests, and physicians can tailor orders from a user-defined pick list. Also, physicians can document where and when specific procedures will take place. As an integrated piece of the overall Health Care Information System, patient billing is automatically updated when an order is filed.
24.				**Flexibility in Administering Care** Ambulatory Order Management arms physicians with a broad range of patient information that increases their ability to provide the highest level of care, and allows them to update patient records in real time with new data. Users can view and manipulate information pertaining to: • Specific patient allergies • Prescription histories, renewals, and changes • Authorized prescriptions from other physicians • Prescription discontinuations.
25.				**Enhanced Patient Safety** Ambulatory Order Management complements other computerized physician order entry (CPOE) products offered by MEDITECH, including Physician Order Management and Prescription Management. Order entry products are intended to help caregivers increase efficiency and ensure the highest level of patient safety. Through automatic system checks for allergies and dangerous drug interactions, potential errors can be reduced or eliminated altogether. In addition, by using an automated system, problems associated with illegible handwriting are eliminated. Ambulatory Order Management can be accessed through a variety of entry points depending on the setting. In the acute care setting, for instance, Ambulatory Order

Line #	Component	Overview	Function	Description
				Management can be accessed through our Emergency Department Management software. In the private physician practice, the system can be opened through the Physician's Desktop or via the Electronic Ambulatory Record.
26.			4. Authorization and Referral Management (ARM)	The Authorization and Referral Management component provides health care organizations with a streamlined approach for managing authorizations and referrals. Comprehensive referrals and authorizations are easily entered and accessible during the scheduling, registration, and billing processes.
27.				**Integration with other MEDITECH Applications** Integration of authorizations and referrals with registration, scheduling, billing, and the recording of the patient's medical account are crucial. This integration provides users with the following capabilities: • Patient and subscriber data entered in Health Information Management and Revenue Cycle products is transferred automatically to Authorization and Referral Management for any patient with referral and authorization activity • Patient data in Authorization and Referral Management is linked to and updated by Health Information Management • The most recent insurance verification data and authorization status flows from Registration to the Authorization/Referral Management database • Authorizations and referrals are linked to scheduled appointments, both individual and series, in Community-Wide Scheduling functionality and automatically depleted when the appointment is attended • Authorization information is automatically updated throughout applications when a patient no-shows or cancels an appointment • In Community-Wide Scheduling functionality, schedulers are flagged when patients are booked for appointments beyond the authorization's expiration date or when the last remaining visit allowed by the authorization has been used or exceeded.
28.				**Medical and Practice Management Suite** MEDITECH has incorporated authorization and referral management into our Medical & Practice Management (MPM) Suite, which serves clinicians and administrative staff in practices, clinics, and other ambulatory locations. This suite includes scheduling, registration, electronic patient records, open item billing, and authorization and referral management to fully automate these facilities. The software also: • Enables organizations to proactively manage referrals and approve/delete authorizations • Facilitates billing by expediting and ensuring reimbursement through entering and processing authorization • Allows clinical staff to properly enter/track referrals out of the enterprise.
29.				**Authorization and Referral Data** Authorizations and referrals for follow-up care are quickly retrieved during scheduling and registration so staff has the necessary details when needed. Authorizations and referrals, also available for viewing through the Enterprise Medical Record, ensure the latest, most comprehensive data is available. The following data is captured: • Multiple unique authorization identifiers, including the authorization number, pre-

Line #	Component	Overview	Function	Description
				certification number, and internal tracking number • Status of each authorization (Pending, Approved, Denied) Referral Type (Physical Therapy, Cardiology, etc.) • Diagnosis and CPT Codes • Requesting provider and/or specialist that the patient has requested • Requested provider searched for, based upon the following provider selection criteria: specialty, physician practice, gender, language, facility, and insurance • Effective and expiration date of the authorization and referral • Special instructions captured in queries or notes section • Custom Referral Forms generated to meet the requirements of your organization. The authorization and referral component contains the following information about any appointments that have been booked or attended against it: • Approved: Number of visits approved by the patient's insurance • Performed: Visit has occurred; patient has been registered, services on authorization have been provided • Scheduled: One or more appointments booked against the authorization in Community-Wide Scheduling • Remaining: Visits/services are completely available, neither performed nor scheduled. Referral Check Dictionary generates additional, user-specified warning messages when: • Patient's insurance status is not ACTIVE • Duplicate referrals exist • Requested provider is not in PCP's Care Group/practice • No referral type noted.
30.				**Referral Processing, Worklists, and Reminders** Users can expedite referral management functions by creating on-line worklists and reminders. With these features, users can: • Prioritize requests and expedite referral management functions, instantly seeing which referrals must be reviewed immediately • Highlight particular issues or events for later review and processing • Process referral worklists on-line with user-defined sort criteria • Track multiple, concurrent authorizations.
31.				**Additional Features/Reporting Capabilities** Users can download existing data from across departments and facilities to organize into useable formats via standard report writer capabilities. Specific functions include: • Cumulative Reporting by number of referrals, by specialty, by requesting/requested provider, and by referral type • Production of standard reports via Compiled Report Capabilities, including

Line #	Component	Overview	Function	Description
				standard authorization and referral and patient reports, or custom report writer routines via integration with other MEDITECH applications • Letters created in either Rich Text or Microsoft® Word® format.
32.				**Security Features** Access to viewing and editing authorizations is based on the security restrictions defined in an organization's Access Dictionary, and is defined for specific users according to facility or database. Access to authorizations and referrals is restricted by: • Authorization status • Insurance • Requesting and requested provider • Specialty • Location • Action • Referral type.
33.			5. Appointment Scheduling	The Medical and Practice Management (MPM) Suite offers flexible scheduling options that simplify the process by which staff members at multiple and single facility health care organizations schedule patient appointments and manage resources. In addition to streamlining scheduling processes, the application helps reduce scheduling errors and missed appointments.
34.				**Automated Patient Scheduling** The application offers the ability to instantly find the first available time slot in which all the resources necessary to perform an appointment are available, or to utilize a "book view" to find the next available appointment. Additional features include: • Alternative appointment times • Control of the time window in which an appointment can take place • Ability to schedule consecutive sessions for a patient • Ability to schedule appointments at different sites • Ability to accommodate both centralized and decentralized scheduling • Flags for frequent no-shows and bad debt • Recurring Visit feature to schedule appointments on a daily, weekly, monthly, or annual basis • Graphical calendars • User-defined buffer periods between appointments • Single, dedicated appointment book scheduling screen for physician practices.
35.				**Access to Patient Information** • Appointment-related instructions for the patient and scheduler • Automatic retrieval of a patient's existing demographic and insurance records across the health care enterprise (even if the patient has never visited the specific location before) • Display of the patient's appointment compliance when scheduling appointments

Line #	Component	Overview	Function	Description
				• Display of the patient's scheduled and pending appointments • Display of patients outstanding health maintenance for physician practices • User-defined access to a patient's Electronic Ambulatory Record for physician practices • Access to patients' outstanding billing/financial information.
36.				**Conflict Checking** Conflict checking warns a scheduler of potential conflicts at the time of scheduling, allowing conflicts to be detected and avoided. Conflicts can be based on patient's gender, age, insurance plan, or other scheduled appointments. Features include: • Resource conflict checking • Personnel conflict checking • Appointment type conflict checking.
37.				**Appointment Communiqués** Several features improve the communication essential for efficient patient appointment scheduling and attendance: • Automatic appointment reminders and cancellation notices, such as letters to patients and e-mail messages to staff • Automatic archiving of system-generated patient letters • User-defined messages in the Appointment Conflict and Resource Appointment Conflict dictionaries • Automatic scheduling alerts.
38.				**Resource Management** Additional features assist the management of personnel, rooms, and equipment: • Ability to schedule patients at specialized facilities within a health care organization • Schedules for multidisciplinary clinicians, arranged to reflect these clinicians' practice patterns; for example, a physician who works both as a general practitioner and as an orthopedic surgeon can be defined as a general practitioner on Mondays, Tuesdays, and Wednesdays and as an orthopedic surgeon on Thursdays and Fridays • Ability to determine appointment duration by appointment type and/or resource profiles • Ability to collect the data necessary to determine the efficiency and frequency of resource use • Ability to monitor and switch resources in an emergency • Ability to enable managers to plan and schedule staff meetings at the most convenient times.
39.				**Wait-listing Capabilities** Wait-listing routines help departments and staff manage resources. Wait listing provides prioritized lists of patients waiting for specific appointments. By utilizing waitlists, facilities minimize or eliminate unproductive time due to cancellations. Wait listing allows staff to:

Line #	Component	Overview	Function	Description
				• Maintain and prioritize waitlisted appointment lists • Track how long a patient remains on a waitlist • Easily move patients from the waitlist to scheduled appointment times • Record latest dates acceptable for patient appointments • Efficiently manage the waitlist process.
40.				**Links With Other Applications** • User-defined links to Medical and Practice Management components • Medical Necessity checks on associated orders allow enterprises to limit certain tests and treatments to only those patients with certain diagnoses (meeting HCFA's requirements) • Scheduling data is shared with MEDITECH's Enterprise Medical Record allowing clinicians to view the patients they are scheduled to see • Link with Medical and Practice Management (MPM) Suite provides a single scheduling system that ties together all facilities and coordinates scheduling across the enterprise • Link with MPM allows automatic insurance verification and access to the patient's most up-to-date demographic information. • Link to Authorization and Referral Management (ARM) to track visits covered for specific referrals/authorizations.
41.			6. Physician Billing and Receivables (PBR)	The Physician Billing & Receivables (PBR) component is a comprehensive physician billing and financial management application, specifically designed to address the unique needs of the physician practice environment. PBR enables full line-item posting, customized patient statements, and automatic generation of primary, secondary, tertiary, and crossover claims. In addition, extensive standard and site-specific reporting options are available, along with electronic claims/remittance and automated collections functionality, thus streamlining your financial processes and enhancing the timeliness of payments.
42.				**Patient Billing** The distinctions made below help illustrate how the PBR application can dramatically streamline your billing processes according to the demands of the physician practice environment. In PBR: • Patients may be assigned one account for life to store their entire financial history • Diagnosis codes are assigned to individual transactions • Receipts and adjustments are applied to individual transactions, enabling line-item reporting.
43.				**Cash Drawer** Available when using the MPM Suite, the cash drawer provides a simple, yet flexible, solution for tracking patient payments collected at the time of service. This includes patient co-payments for a day's encounter or payments made for previous charges on a patient's account. Following the entry of payments, a statement at the time of service can be quickly generated. Standard options are available to assist with balancing and closing each cash drawer at the end of the day.

Line #	Component	Overview	Function	Description
44.				**Powerful Reporting** With a wide variety of standard reports, user-friendly Selection Reports, and a powerful custom report writing tool, performance may be effectively monitored on many levels. Highly focused volume and revenue reports can be generated, with details of financial activity organized by payer, insurance, provider, practice, location, department, and division, along with Managed Care and reimbursement. Standard reporting categories include: • Patient-, diagnosis-, and transaction-based reporting • Accounts receivable and collection reports • Volume and revenue statistics • Managed care and reimbursement analysis.
45.				**Automated Collections** PBR automates many of the collection functions physician practices typically execute manually, not only saving valuable staff time, but also increasing the success and timeliness of your collection efforts. The on-line Collection Worklist allows users to automatically generate, at user-specified intervals, separate "worklists" for their various collections staff, sorted and selected according to their own criteria. Collections staff efficiently process their individual worklists using a single Worklist Processing screen from which delinquent balances may be reviewed at the charge level and resolved with the patient or insurance provider. Staff may process one or several accounts at a time, adding comments, letters, and reminders, or re-creating claims for insurances. Collection features include: • Automatic generation of separate worklists for individual collections staff • Flexible worklist sorting and selection criteria • Single Worklist Processing screen.
46.				**Seamless Integration** PBR is seamlessly integrated with the financial and executive reporting components of the MEDITECH HCIS. This integration allows patient financial data to be safely and securely shared across your enterprise according to your needs. Available integration options include: • Data Repository • Executive Support System • General Ledger • Accounts Payable.
47.				**Data Security** Within PBR, each user has a distinct mnemonic code and password, and users are restricted to only the information for which they are authorized. Additional security features include: • Custom menus that allow users access to only those specific routines and functions appropriate to their roles

Line #	Component	Overview	Function	Description
				• Access to specific financial information that may be limited based on user profiles • Audit trails that identify users who post financial transactions or make edits to them.
48.	Patient Care and Patient Safety	The Patient Care and Patient Safety product provides the clinical tools needed to deliver safe, quality patient care. Nurses manage patient's care through a convenient Status Board which helps them to prioritize tasks; quickly access needed information, and remain organized throughout their shifts. Care is documented efficiently in a spreadsheet format. Medications and transfusions, meanwhile, are administered safely using the product's bedside verification features.	1. Patient Care	The Patient Care functionality in MEDITECH's Patient Care and Patient Safety product is an electronic documentation system offering care providers interdisciplinary Plans of Care required for a patient-focused care delivery system. Automated worklists allow care providers to document care using a point-of-care-device. PCS display panels provide the ability to observe up-to-date patient information. Dynamic electronic links to MEDITECH's Enterprise Medical Record (EMR) offer care providers another resource for their clinical decisions. These links support critical data review during the assessments and outcomes documentation process.
49.				**Patient Care Management** The Patient Care functionality enables a care provider to: • Create a patient assignment and identification lists. A care provider assignment list displays a particular care provider's patients. • Initiate a Patient Standard of Care for delivery of protocol or location-specific patient care • Generate a suggestion list of problems from assessments. This list can be included on a patient's Plan of Care • Establish a Plan of Care for an individual patient. This can be a care plan or a critical path for the generation of worklists and assessments. To facilitate the transition of automating patient care planning and on-line documentation, standard care plans are delivered during installation of the functionality.
50.				**Clinical Content** Dictionaries serve as the foundation for automating patient care management. This clinical content, developed by expert clinicians, comprises the standard Plans of Care. The standard system dictionaries include: • The Assessment Dictionary, which is used to define the input screens that appear during the documentation of a particular intervention from the worklist. Assessments are associated with interventions in the Intervention Dictionary • The Intervention Dictionary, which is used to define functions, treatments, or tasks that a care provider performs on behalf of the patient. Interventions are associated with out-comes on the Plan of Care • The Outcome Dictionary, which assists the care provider in defining measurable patient goals and achievements. The outcomes are based on interventions for a particular problem on the patient's Plan of Care • The Problem Dictionary, which defines the nature of the patient's health disorder. Problems are associated with a particular Plan of Care. Problems may be added independently to a particular plan or triggered based on a response to an

Line #	Component	Overview	Function	Description
				assessment query • The Plan of Care Dictionary, which includes the group of problems, outcomes, interventions, and assessments associated with a particular plan.
51.				**Documentation of Patient Information** The Patient Care functionality allows care providers to electronically view, update, and process relevant patient information components of a Plan of Care. It supports the delivery of a patient-focused care system and offers a means to capture clinically significant data on the patient's progress. Documentation features enable care providers to document: • Interventions and assessments on a worklist. A worklist contains the interventions or tasks that the care provider will perform for the patient • Spreadsheet Documentation, used as a tool for simultaneous data review and data entry, allows for: – care providers to document assessments, intake and outputs, medications, laboratories, and wave forms to be included – drag and drop capabilities for rearranging data for care providers viewing preference – graphing upon demand – data documented to enter EMR in real-time. • Outcome evaluations, including EMR data review capabilities • Variances from a Critical Path indicating source, subtype, and status • Free text notes and templates that may be linked to a problem, outcome, intervention, or order • Medication Administration Record (MAR). The on-line MAR documents activity related to patient medications such as: – administration, entering a comment, entering reason medication wasn't given, and adjusting actual dosages – changing a medication's order, viewing a medication's order and dose instruction – clinical indicator, monograph, and associated data for a specific medication – Allergy Management, and the patient's Enterprise Medical Record • Resident Assessment Instrument (RAI), which includes Minimum Data Sets (MDS), Resident Assessment Protocols (RAPS), and the Resource Utilization Group (RUG) questionnaires. This documentation gives skilled nursing facilities and other long-term care providers the ability to develop a patient Plan of Care and to report patient information to health care agencies.
52.				**Reporting and Printing Capabilities** The Patient Care functionality features extensive reporting and printing capabilities. The reports enable care providers and organizations to summarize information in various formats. Users have the flexibility to specify the level of detail to be included on these reports for printing. The functionality enables users to print and report: • Patient profiles, including data screens, orders, current medications, interventions,

Line #	Component	Overview	Function	Description
				notes, and data histories • Up-to-date Plans of Care, care provider worklists, and patient care summaries and output formats capturing documentation data • Variance Reports from Critical Pathways, tracking individual patient variance information and cross patient statistical data • Audit Reports listing documented patient care. These reports can be created in an unlimited number of formats.
53.			2. Bedside Verification	Bedside Verification functionality in MEDITECH's Patient Care and Patient Safety product allows caregivers to utilize bar code scanning technology prior to administering medications and blood products. During the medication administration process, Bedside Verification is used to confirm patient identity and medication information against data readily available via MEDITECH's on-line Medication Administration Record. Immediate access to a patient's current results and medication administration information greatly reduces preventable medication errors. The use of bar code scanning increases accuracy and efficiency of caregivers administering medications, providing physicians faster and easier access to critical information to manage patient care. MEDITECH's Bedside Verification functionality also utilizes bar code scanning prior to administering blood products, to confirm patient identity, ensure the right unit is transfused to the right patient, and verify information available in the Transfusion Administration Record.
54.				**Bar Code Scanning** Caregivers scan bar codes on patient wristbands and medications to correctly identify the patient and the appropriate medication. Medications are identified by NDC numbers or the appropriate prescription number generated by the Pharmacy. Bedside Verification processes the data contributing to safe administration by ensuring the "Five Rights" of safe medication administration: Right Patient, Right Medication, Right Dosage, Right Route, and Right Time. Bar code scanning is also utilized to ensure safe blood transfusions. Blood products and unit information - including unit blood type and product - are also bar coded, to accurately reconcile the correct unit and correct blood product with the correct blood type being administered to the patient.
55.				**Decision Support** The latest test results, allergies, and medication orders are immediately available through the patient profile to alert the caregiver to any potential problems prior to medication administration. If the scanned medication is not on the patient profile, the caregiver is given the option within the system to enter a new order and to record administration documentation. Since medication information is scanned and matched to the hospital's formulary dictionary - checking for drug interactions, allergies, and duplications - dose ranges can be performed prior to administering medications to the patient. Likewise, the latest laboratory data is presented to the care provider when administering blood products, providing an additional safety check and identifying any

Line #	Component	Overview	Function	Description
				potential problems before the blood is transfused to the patient.
56.				**Audit Trails** Details of the patients and medications scanned during the process of completing the on-line Medication Administration Record are made available through audit reports as well as details of the transfusion verification and administration process.
57.				**Dictionaries** Bedside Verification users can access dictionaries to identify appropriate NDC and prescription numbers that will be recognized by the bar code scanner. Alternate NDC numbers can also be set up in the dictionary to link drugs that are equal in every way except for manufacturer. Both primary and alternate NDC numbers are recognized by the system to match bar code information with the medication associated with prescriptions on the patient profile.
58.	Enterprise Medical Record	MEDITECH's Enterprise Medical Record provides clinicians an easy to use source for viewing patient information from throughout the health care organization and a convenient tool for entering orders. Complete visit histories are stored electronically for patients over the course of their lifetimes.	1. Enterprise Medical Record	MEDITECH's Enterprise Medical Record (EMR) represents a single source for viewing all relevant patient information — from all aspects of clinical care — throughout the health care delivery system. Complete visit histories are electronically stored for each patient over the course of an entire lifetime. The EMR contains information from visits conducted anywhere along the continuum of care — ambulatory centers, hospitals, physicians' offices, home health agencies, long term care facilities, and satellite laboratories. The information contained in the EMR is updated on a real-time basis. Whenever an order is placed or a test is conducted, the patient's record of care is automatically updated. MEDITECH's EMR accepts data from all sources throughout the enterprise, including both the MEDITECH Health Care Information System and other vendors' systems. This data is collected in the EMR and displayed in one consistent, easily readable format.
59.				**Current Care/Clinical Information** The EMR gives care providers instant and immediate access to a comprehensive, computerized record of current patient care and clinical procedures. This record includes: • Test results • Medications • Vital signs • Patient care (nursing) documentation • Orders • Reports. This information is viewed in convenient panel displays. Panels are designed to group data into clinically meaningful display groupings where clinicians can compare all facets of patient data.
60.				**Historical Patient Data**

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				Complete visit histories from all components of the health care delivery system are available within the EMR. Users can check off the visit(s) for which they want to see patient information, or they can request a compilation of the data from all visits. This data includes: • Medical history and test results • Abstracts from previous visits • Demographics.
61.				**Outpatient Information** The EMR supports the entire continuum of patient care through integration with the health care organization's outpatient providers. Care providers connect through local area and wide area networks based on open systems capabilities and advanced telecommunications. Information is retrieved from many care center locations including: • Physicians' offices • Outpatient surgical centers • Nursing homes • Home health care agencies • Satellite labs • Rehabilitation centers • Health Maintenance Organizations (HMOs). The EMR offers maximum accessibility, in a single inquiry, to any number of users at the same time. Users have direct, immediate access from any workstation in the health care organization. Authorized clinicians can access the EMR from their homes or offices.
62.				**Current Administrative Data** The EMR includes all patient-related administrative data in a single record. This data includes: • Complete demographics • Insurance information • Diagnostic and procedure code assignments.
63.				**Graphical Display of Data** Within the EMR, results may be charted in easy-to-interpret graphs, including point, bar, and line graphs. This allows users to pinpoint abnormalities and trends, so decisions are made more quickly, enhancing a patient's quality of care. To help with data assessment, the system features: • Automatic plotting of results • Color graphs • Abnormal result flags.
64.				**Confidential Records of Care** Enterprise medical records remain secure throughout the care network, as the entire

Line #	Component	Overview	Function	Description
				system is password-driven. Care networks can define restrictions of all users based on specific categories of information. Restrictions also can be implemented by different levels of viewing, according to the level of access the health care enterprise gives each of its users.
65.			2. Order Entry	The Order Entry functionality in MEDITECH's Enterprise Medical Record product provides clinicians fast, accurate entry of orders along with immediate access to patient information and test results. The functionality links patients' locations to clinical departments in a powerful information network by reducing the time required to: • Identify a patient • Enter, edit, and cancel patient orders • Enter groups of orders from multiple departments as a set with one entry • Enter series orders • Enter and track the status, request date, and service date of an order • Enter and retrieve clinical data • Capture costs and charges of procedures • Generate reports and statistics for nursing areas and ancillary departments • Retrieve information from archival storage.
66.				**Single-Screen Access** The functionality offers convenient, single-screen access to multiple functions. This allows order entry staff, from one screen, to: • Enter an unlimited number of orders from different departments • Enter an unlimited amount of order sets, series orders, and clinical interventions • Access all patients at a location • Enter, amend, cancel, print, or verify orders • View clinical results and reports • Enter patient payments for services rendered. Ancillary departments can also process orders from one screen, with the ability to enter orders, amend orders, edit the status of an order, reprint orders, and enter charges and credits.
67.				**Organization-Defined Functions** The functionality separates patient care functions from ancillary department functions. Organization-defined screens allow an organization to: • Individualize the requisitions for each department and procedure • Tailor each procedure to suit an organization's needs, ultimately streamlining the ordering process • Record patient administrative and order information for quick and easy on-line reference • Display information in an easy-to-understand format, with pre-defined instructions and documentation.
68.				**Accurate, Efficient Order Entry**

Line #	Component	Overview	Function	Description
				The functionality is accessible from any location with Internet access. Users quickly access information about medical conditions and care via the hospital's Web site or intranet. Features include: • Series order capabilities, with user-defined limits • Ordering screens to facilitate the entry of multiple orders for all departments • Checking for duplicate procedures during the ordering process based on organization-defined limits • Lists of verified, unverified, incomplete, cancelled, uncharged, and overdue orders • Prompts for required information to guarantee accuracy • Ability to review patient orders by order date or service date • Ability to amend, cancel, print or validate orders • Lists of patients' daily orders itemizing all tests and treatments • Lists of occupied and available beds for each location • Routines for ordering location supplies and maintenance requests • Dietary data, easily viewed and updated • Dietary reports detailing patients' diet histories, current diets, and restrictive diets • Meal counts, meal labels, and nourishment labels • Features to limit ordering access to specific departments based on user passwords • Sophisticated security features, including audit trails.
69.				**Instantly Accessible Patient Data** The functionality stores administrative, clinical, and dietary data, allowing staff to review and update the data instantly. • Staff has instant access to current data such as diagnoses, patient condition, visitor permissions, allergies, test results, and current diet • Users can review and update orders to check priority, service date, and status • Users can review all orders entered for a patient or location on a specific date • Patient tracking available via the temporary location feature.
70.				**Patient Costs Transmitted throughout the Network** The functionality transmits patient costs to a health care organization's financial system. Each facility has control of costs, allowing it to: • Determine at what status an order is charged • Set a charge for each test or treatment • Determine which charges can be edited • Print lists of patient charges • Generate reports listing daily patient charges • Enter patient payments for services rendered or enter non-patient revenues via the Cashier's Option, instantly generating a preliminary notice of charges.
71.				**On-Line Reports and Statistics** Reports and statistics help management maintain accurate records, detect patient care trends, and analyze future requirements.

Line #	Component	Overview	Function	Description
72.				**Electronic Signature** Any user can enter clinical orders, even if the user lacks authority to sign them. As a result, ward clerks can enter verbal or phone orders, and interns can enter orders that require physician signature. Many health care organizations' policies require that such an order be signed by an authorized provider within 24 or 48 hours of entry.
73.				**Rules-Based Logic** Within the functionality, rules can be set up to check query information from an order screen. User-defined rules direct care providers to the next logical step in a given procedure as well as flag dangerous or unusual values. This information may include a patient's age, sex, location, etc. The system evaluates the rule based on these factors. To alert a user of an unacceptable response, the rule can include a data field, which displays an error message but does not allow a user to file new values, or a warning message that allows filing. With rules-based logic, your organization saves time and resources by eliminating unnecessary workload (such as duplicate testing) while improving the quality of patient care. Maintaining a logical flow of information also reduces the number of mistakes that can be made.
74.	Emergency Department	The Emergency Department product assists clinicians and staff with the critical task of managing patients quickly and efficiently, from the moment patients enter the Emergency Department until discharge.	1. Integrated Desktop and Patient Tracking System	The Patient Tracker Integrated Desktop allows the Emergency Department staff to document the daily functions performed in their care/treatment of patients and manage patient flow from a central point of entry.
75.			2. Reception	During periods of peak activity, patients often enter the Emergency Department simultaneously. When this occurs, a triage nurse needs to quickly create a worklist so patients are triaged in proper order. The Reception routine allows triage nurses to record the small number of data fields necessary to get Emergency patients into the system quickly. Patients are then able to have orders placed, assessments performed, and documentation filed (even before patients are fully registered).
76.			3. Registration	The Registration routine collects demographic and biographic information, as well as insurance, next of kin, and incident information.
77.			4. Patient Documentation and Triage	Documentation is an important part of health care. Our assessment functionality provides access to neatly organized nursing assessments through routines specifically designed for the Emergency Department's workflow. The assessment data flows seamlessly into the MEDITECH Nursing application, providing a superior level of medical record continuity.
78.			5. Efficient Management of Ambulatory Orders	MEDITECH's Ambulatory Order Management routine provides a health care network with the ability to track a patient's complete ambulatory profile. This can include prescriptions that were generated from the MEDITECH system in outpatient settings, from the provider's office, discharge from inpatient visits, or upon departure from the Emergency Department. Diagnostic procedures can also be generated to and communicated to appropriate ancillary services to ensure the proper follow-up care is provided to patients. Clinical staff can even identify prescriptions that are from outside

Line #	Component	Overview	Function	Description
				of their network, so that they can be accounted for and incorporated into the patient's accurate ambulatory profile. Ambulatory Order Management utilizes a wide range of patient safety measures to ensure the safe and effective distribution of prescriptions. The high level dynamic integration between Ambulatory Order Management and Provider Order Management allows Emergency Department staff to quickly and safely convert ambulatory prescriptions into current medication orders and vice versa. This inherent integration allows Emergency Department clinicians to effectively reconcile a patient's "at home" medications and gives them a greater understanding of a patient's chronic and acute medical conditions.
79.			6. Documentation	The application's Documentation routine allows clinicians to enter free text notes and reports into the system. The routine provides quick and easy means to complete documentation, while at the same time, providing many of the same features found in our Departmental application. Users are able to enter fields and load canned text entries. Additionally, users can customize the Emergency Department Tracker which allows for quick and efficient clinical documentation. With the Emergency Department Tracker documentation routine, users can arrange documentation screens and fields to appear on a single template or on specific choices of templates. Users navigate through the documentation process by clicking on questions and responding either with hard coded data or by using the MEDITECH text editor. Users also have the ability to retrieve specified results, such as Laboratory results, medication orders, and vital signs, to incorporate into the documentation. The documentation entered in the Emergency Department appears in PCI or EMR for the attending physician to review.
80.			7. Discharge	The Advanced Discharge/Departure routine helps staff complete required paper work when patients are ready to leave. This feature includes the ability to automatically provide patient care instructions. When a clinician files the discharge screen, the system automatically departs the patient while discharge instructions, follow-up reminders, referrals, forms, and prescriptions are printing.
81.			8. Comprehensive Medical Record	The Emergency Department Management application feeds data to our Patient Care Inquiry application to produce an integrated medical record throughout the Health Care Information System. A patient's Emergency Department visit data is available online from any client or terminal within the HCIS, for any user with access to view this information.
82.			9. Security	Control of information and confidentiality of patient data are common concerns among health care organizations. The Emergency Department Management application provides user- and group-controlled access to information. A double key password system and custom menus supplied by the MIS application helps prevent unauthorized access. Dictionary controlled settings and audit trails provided by the application further help your IS staff control authorized access and potentially reduce

Line #	Component	Overview	Function	Description
				security breaches.
83.			10. Follow-Up and Call Management	We anticipate that clinical staff might elect to electronically mark selected patients for follow-up (F/U) calls, revisits, or other types of intervention by placing reminders. A reminder queue within the application allows users to document the follow-up management. The system can be used to log incoming calls and record them on patients' records.
84.	Patient Discharge Instructions	MEDITECH's Patient Discharge Instructions are a library of physician-approved recovery care instructions nurses and physicians can give to departing patients to explain their conditions, provide advice for home care and how to prevent complications, indicate signs and symptoms to be aware of, and guide patients as to when it is appropriate for them to seek medical help. Integration is a key benefit of MEDITECH's Patient Discharge Instructions, as they minimize the time providers spend generating instructions, and result in an educational handout tailored to a patient's specific condition. At the time of discharge, a nurse or physician selects from the library of standard instructions. The system then automatically incorporates the patient's demographic data and medication information, collected from throughout MEDITECH's HCIS, into the patient's instructions. Released initially for use in departing patients from the Emergency Department, MEDITECH's Patient Discharge Instructions are now being expanded for use when	1. Patient-Friendly Content	MEDITECH's Patient Discharge Instructions contain an overview of the patient's condition, advice for home care and how to prevent complications, signs and symptoms to be aware of, and guidance on when it is appropriate to seek medical help. Aimed at the 8th grade reading level, instructions are written in both English and Spanish, and include pictures so they are easy to understand. Furthermore, instructions print in a standard, easy-to-read format. Below is a sampling of some of the diagnoses for which discharge instructions are currently available: • Sprains and Strains • Pneumonia • Ear Infection • Common Cold (pediatric and adult) • Sore Throat (pediatric and adult) • Strep Throat (pediatric and adult) • Flu (pediatric and adult) • Back Pain • Cast Care • Urinary Tract Infection • Fractures • Collar Bone Fracture • Skin Abscesses • Animal Bites • Human Bites • Insect Bites and Stings • Tick Bites.
85.			2. Ability to Incorporate Supplemental Instructions	Fill-in fields located beneath the standard instructions allow caregivers to incorporate visit-specific information such as activity restrictions, follow-up appointments, and return to work information into instructions before they are printed. Supplemental instructions print in the same format as the patient instructions, creating a seamless appearance. Furthermore, caregivers can attach patient instructions and other information developed by the health care organization.
86.			3. Integrated Information	Patient demographic data and prescribed medication information from throughout the MEDITECH HCIS are automatically incorporated into patient discharge instructions. Completed discharge instructions can be easily stored with the patient's electronic

Line #	Component	Overview	Function	Description
		departing patients from physician appointments, clinic visits, and inpatient stays as well. Customers who license MEDITECH's Patient Discharge Instructions today will receive these extensions of the product's capabilities and additional patient instructions at no charge as they become available.		medical record for future recall.
87.			4. Streamlined Provider Workflow and Cost Efficiency	MEDITECH's Patient Discharge Instructions save nurses and physicians valuable time. The system's inherent integration automatically pulls patient information directly from the HCIS into discharge instructions. This integration reduces time spent on data entry and allows nurses and physicians to quickly and conveniently access the patient's record from anywhere in the HCIS. Furthermore, organizations benefit from having a cost effective solution that eliminates the need to maintain stored, printed materials.
88.			5. Greater Patient Satisfaction and Compliance	MEDITECH's Patient Discharge Instructions help health care organizations meet Joint Commission requirements for patient and family education. The instructions empower patients with information specific to their conditions and care, and offer reminders of appointments and referrals. As a result, these patients are ultimately more satisfied with their care, caregiver, and health care facility. A confident patient feels more comfortable asking questions of his/her provider and is more apt to comply with care recommendations, promoting a faster healing time with fewer complications.
89.	Patient Education & Internet for Patients	MEDITECH's Patient Education and Internet for Patients product enables health care consumers to manage their health proactively. The application both educates consumers about common medical diagnoses, treatments, and medications, and enables patients to communicate with caregivers electronically through the Internet. Organizations using MEDITECH's Patient Education and Internet for Patients product are assured that their consumers have both relevant, easy to understand information about medical conditions and treatments, and a convenient tool for communicating with health care providers.	1. Information on Common Diagnoses	The product provides more than 90 educational topics on the leading diagnoses and treatments. The following is a sample of some of the diagnoses provided: • Angina • Asthma • Cerebral Vascular Accident • Cholecystectomy • Chronic Obstructive Pulmonary Disease • Diabetes Type 1 • Diabetes Type 2 • Congestive Heart Failure • Deep Vein Thrombosis • Hypertension • Myocardial Infarction • Normal Vaginal Delivery • Pediatric Asthma • Pneumonia • Total Hip Replacement • Total Knee Replacement • Unstable Angina.
90.			2. Easy-to-Use Format	A multimedia design helps reduce patients' anxiety and increase their involvement in the care process. Easy-to-read text, colorful graphics, and animated movies present information in an interactive, user-friendly format, which uses: • Point-and-click navigation • Narration • Everyday vocabulary and definitions • Closed-captioning for the hearing impaired.

Line #	Component	Overview	Function	Description
91.			3. Easy Access to Information	Users quickly access information about medical conditions and care via the hospital's Web site or intranet. The product is accessible from any location with Internet access, including: • Physicians' offices • Hospital locations (at patients' bedsides, hospital kiosks, or patient lounges) • Affiliated facilities • Patients' homes • Hospital outreach.
92.			4. Links to Relevant Information	A browser-based format allows organizations to link their own tailored guidelines and protocols, as well as favorite Web sites to the Patient-Centered Education product.
93.			5. Joint Commission Compliance	MEDITECH's Patient-Centered Education content helps organizations to meet Joint Commission patient education requirements. Patients can continue to access their profiled information and prescribed treatments from home. For those patients without Internet access, information can be printed and presented to the patient prior to discharge from the hospital or physician's office.
94.			6. Security	Password protection ensures that patients have access only to the information pertinent to their present conditions. A new clinical profile is created and a new password is assigned each time the patient visits the hospital.
95.			7. Patient Communication Features	The Patient Education and Internet Access for Patients product optimizes the speed and convenience of the Internet to help health care organizations to develop and maintain effective electronic relationships with their patients. Consumers have quick, secure access to information in a familiar browser format. Patients using MEDITECH's Internet Access features can: • Verify appointment schedules and view a log of past visits • Request appointments • Update demographic and insurance information • Confirm health plan and billing information • Request prescription renewals • Review educational materials through MEDITECH's Patient Education application • View their own test results and reports through the organization's Web site • Communicate sensitive medical information to providers at any time, in complete confidence • Check an access log that lists the names of all users who have viewed their information, as well as the dates and number of times viewed. MEDITECH ensures that patient data communicated using this product is secure and encrypted when transmitted via the Internet.
96.	Scheduling and Referral Management	Scheduling and Referral Management simplifies the process by which staff	1. Community-Wide Scheduling	The Community-Wide Scheduling functionality in MEDITECH's Scheduling and Referral Management product simplifies the process by which staff members at multiple and single facility health care organizations schedule appointments. The

Line #	Component	Overview	Function	Description
		members schedule patient appointments and manage authorizations and referrals throughout your organization. This software helps to reduce scheduling errors and missed appointments. It also helps you to coordinate resources and support managed care environments efficiently. Referrals and authorizations are easily entered and accessible during the scheduling, registration, and billing processes.		functionality helps users to reduce scheduling errors and missed appointments, manage resources efficiently, and support managed care environments.
97.				**Automated Patient Scheduling** The functionality instantly finds the first available time slot in which all the resources necessary to perform an appointment are available. Features include: • Alternative appointment times • Control of the time window in which an appointment can take place • Ability to schedule consecutive sessions for a patient • Ability to schedule appointments at different sites • Ability to accommodate both centralized and decentralized scheduling • Flag for frequent no-shows and bad debt • Recurring Visit feature to schedule appointments on a daily, weekly, monthly, or annual basis • An automatic rescheduling feature which finds new times based upon the original appointment's criteria • Graphical calendars • User-defined buffer periods between appointments • Single, dedicated appointment book scheduling screen for physician practices.
98.				**Access to Patient Information** • Appointment-related instructions for the patient and scheduler • Automatic retrieval of a patient's existing demographic and insurance records (even if the patient has never visited the site before) • Display of the patient's appointment compliance when scheduling appointments • Display of the patient's scheduled and pending appointments.
99.				**Conflict Checking** Conflict checking warns a scheduler of potential conflicts at the time of scheduling, allowing conflicts to be detected and avoided. Conflicts can be based on patient's gender, age, insurance plan, or other scheduled appointments. Features include: • Resource conflict checking • Personnel conflict checking • Appointment type conflict checking.
100.				**Appointment Communiqués** Several features improve the communication essential for efficient patient appointment scheduling and attendance, such as: • Automatic appointment reminders and cancellation notices, such as letters to patients and e-mail messages to staff • Automatic archiving of system-generated patient letters • User-defined messages in the Appointment Conflict and Resource Appointment Conflict dictionaries.
101.				**Resource Management**

Line #	Component	Overview	Function	Description
				Additional features assist the management of personnel, rooms, and equipment, for example: • Ability to schedule patients at specialized facilities within a health care organization • Schedules for multidisciplinary clinicians can be arranged to reflect these clinicians' practice patterns; for example, a physician who works both as a general practitioner and as an orthopedic surgeon can be defined as a general practitioner on Mondays, Tuesdays, and Wednesdays and as an orthopedic surgeon on Thursdays and Fridays • Ability to determine appointment duration by appointment type and/or resource profiles • Ability to collect the data necessary to determine the efficiency and frequency of resource use • Ability to monitor and switch resources in an emergency • Ability to enable managers to plan and schedule staff meetings at the most convenient times.
102.				**Wait listing Capabilities** Wait-listing routines help departments and staff manage resources. Wait listing provides prioritized lists of patients waiting for specific appointments. By utilizing waitlists, facilities minimize or eliminate unproductive time due to cancellations. Wait listing allows staff to: • Maintain and prioritize waitlisted appointment lists • Track how long a patient remains on a waitlist • Easily move patients from the waitlist to scheduled appointment times • Record latest dates acceptable for patient appointments • Efficiently manage the waitlist process.
103.				**Links With Other Applications** • Link with MEDITECH's Enterprise Medical Record application allows users to automatically place any associated orders when scheduling an appointment • Medical Necessity checks on these associated orders allow enterprises to limit certain tests and treatments to only those patients with certain diagnoses (meeting HCFA's requirements) • Scheduling data is shared with MEDITECH's Enterprise Medical Record; authorized users can access a list of patients' scheduled appointments and clinicians can get a list of patients they are scheduled to see • Link with MEDITECH's Medical and Practice Management application provides a single scheduling system that ties together all facilities and coordinates scheduling across the enterprise • Link with MEDITECH's Medical and Practice Management allows automatic insurance verification and access to the patient's most up-to-date demographic information.
104.				**Support For Managed Care Environments** The functionality enables health care organizations to maximize returns on managed

Line #	Component	Overview	Function	Description
				care contracts by improving scheduling efficiency and resource allocation, for example: • The statistical information collected and retrieved by the application helps health care organizations negotiate managed care contracts • Patient tracking information can be used to determine staffing requirements necessary to satisfy future contracts • The functionality provides the ability to avoid registration delays, last minute cancellations, and lost reimbursement by efficiently managing insurance-related tasks.
105.			2. Authorization and Referral Management	The Authorization and Referral Management functionality in MEDITECH's Scheduling and Referral Management product provides health care organizations with a streamlined approach for managing authorizations and referrals. Comprehensive referrals and authorizations are easily entered and accessible during the scheduling, registration, and billing processes.
106.				**Integration with other MEDITECH Applications** Integration of authorizations and referrals with registration, scheduling, billing, and the recording of the patient's medical account are crucial. This integration provides users with the following capabilities: • Patient and subscriber data entered in our Health Information Management and Revenue Cycle products is transferred automatically to Authorization and Referral Management for any patient with referral and authorization activity • Patient data in Authorization and Referral Management is linked to and updated by Health Information Management • The most recent insurance verification data and authorization status flows from Registration to the Authorization and Referral Management database • Authorizations and referrals are linked to scheduled appointments, both individual and series, in the Community-Wide Scheduling functionality and automatically depleted when the appointment is attended • Authorization information is automatically updated throughout applications when a patient no-shows or cancels an appointment • In the Community-Wide Scheduling functionality, schedulers are flagged when patients are booked for appointments beyond the authorization's expiration date or when the last remaining visit allowed by the authorization has been used or exceeded.
107.				**Medical & Practice Management Suite** MEDITECH has incorporated authorization and referral management into our Medical & Practice Management Suite, which serves clinicians and administrative staff in practices, clinics, and other ambulatory locations. This suite includes scheduling, registration, electronic patient records, open item billing, and authorization and referral management to fully automate these facilities. The software also: • Enables organizations to proactively manage referrals and approve/delete authorizations • Facilitates billing by expediting and ensuring reimbursement through entering and

Line #	Component	Overview	Function	Description
				processing authorization data • Allows clinical staff to properly enter/track referrals out of the enterprise.
108.				**Authorization and Referral Data** Authorizations and referrals for follow-up care are quickly retrieved during scheduling and registration so staff has the necessary details when needed. Authorizations and referrals, also available for viewing through the Enterprise Medical Record, ensure the latest, most comprehensive data is available. The following data is captured: • Multiple unique authorization identifiers, including the authorization number, pre-certification number and internal tracking number • Status of each authorization (Pending, Approved, Denied) • Referral Type (Physical Therapy, Cardiology, etc.) • Diagnosis and CPT Codes • Requesting provider and/or specialist which the patient has requested • Requested provider searched for based upon the following Provider Selection Criteria: specialty, physician practice, gender, language, facility, and insurance • Effective and expiration date of the authorization and referral • Special instructions captured in queries or notes section • Custom Referral Forms generated to meet the requirements of your organization. The authorization and referral contains the following information about any appointments that have been booked or attended against it: • Approved: Number of visits approved by the patient's insurance • Performed: Visit has occurred; patient has been registered, services on authorization have been provided • Scheduled: One or more appointments booked against the authorization in Community-Wide Scheduling • Remaining: Visits/services are completely available, neither performed nor scheduled. Referral Check Dictionary generates additional, user-specified warning messages when: • Patient's insurance status is not ACTIVE • Duplicate referrals exist • Requested provider is not in PCP's Care Group/practice • No referral type noted.
109.				**Referral Processing, Worklists, and Reminders** Users can expedite referral management functions by creating on-line worklists and reminders. With these features, users can: • Prioritize requests and expedite referral management functions, instantly seeing which referrals must be reviewed immediately • Highlight particular issues or events for later review and processing

Line #	Component	Overview	Function	Description
				• Process referral worklists on-line with user-defined sort criteria • Track multiple concurrent authorizations.
110.				**Additional Features/Reporting Capabilities** Users can download existing data from across departments and facilities to organize into useable formats via standard report writer capabilities. Specific functions include: • Cumulative Reporting by number of referrals, by specialty, Requesting/Requested Provider and by Referral Type • Production of standard reports via Compiled Report Capabilities, including standard authorization and referral and patient reports, or custom report writer routines via integration with other MEDITECH applications • Letters created in either Rich Text or Microsoft Word® format.
111.				**Security Features** Access to viewing and editing authorizations is based on the security restrictions defined in an organization's Access Dictionary, and is defined for specific users according to facility or database. Access to authorizations and referrals is restricted by: • Authorization status • Insurance • Requesting and requested provider • Specialty • Location • Action • Referral type.
112.	Revenue Cycle	MEDITECH's Revenue Cycle application accommodates multi-entity accounting with centralized and decentralized billing and assists with every aspect of a health care organization's billing and collections.	1. Integration With Other Applications	Integration With Other Applications • Billing data is transferred daily and monthly to General Accounting • Patient refund data is passed to General Accounting • Procedure volumes are analyzed in General Accounting • Patient data is transferred to/from the Health Information Management application.
113.			2. Instant Access and Update of Pertinent Information	Instant Access and Update of Pertinent Information • Uniform access to all accounts: inpatient and outpatient, unbilled, accounts receivable, and bad debt • Complete account details and history for all account statuses • Individual screens allow user to view/print all changes, payments, adjustments, refunds, and late charges for an account based on transaction type selected • Authorization of users, based on access restrictions, for data entry, edit, or view-only privileges • Maintenance of complete guarantor, insurance, DRG, and UB92 data.
114.			3. Contract Management	Contract Management Multiple Contract Management routines make it easy for health care organizations to govern managed care agreements and assist with negotiating and monitoring

Line #	Component	Overview	Function	Description
				contracts with third-party payers. • A Contract Dictionary stores vital administrative information such as crucial dates, contract evaluation (concurrent, retroactive), contract terms, and notes taken during contract negotiation • Insurance identification routines streamline the process of assigning insurance plans • Proration rules are used to calculate expected reimbursement to monitor managed care agreements • Various reports help management determine if both parties are meeting predetermined managed care arrangements.
115.			4. Interim Billing	Interim Billing • An unlimited number of bills can be generated based on how billing cycles are established • Rules are established to bring groups of accounts through the billing cycle prior to a discharge date, allowing an organization to bill for charges incurred while the patient account is still active • A unique bill number is assigned for each billing cycle that is completed on an account • As claims are resolved, reimbursement is accurately tracked so secondary payers can be billed automatically • Date range bills can be produced automatically to allow your health care organization to bill insurance companies for monthly charges or charges for any specified date range.
116.			5. Late Charge Bills	Late Charge Bills • Proration rules can be established specifically for late charge bills in the event a payer requires different reimbursement • Charges posted after the final bill has been cut off are initially considered UR dollars and are eligible for late charge billing.
117.			6. Other Billing Features	Other Billing Features • Rules can be established for final, interim, or late bill generation based on payer and/or account type • Bills, claims, and statements can be printed or reprinted on demand by authorized users • Account balances and bills, which will automatically be generated, can pass automatically from one insurance group to another or to the patient based on receipts and/or elapsed days without activity • Facility-specific amounts allow for the accurate recording of revenue, identifying a facility associated with a site that performed a service • Patient charges are tracked throughout enterprises, regardless of at which entity the costs were incurred • Charges can be flagged and prorated appropriately according to the Medical Necessity checks; charges also may be dropped or moved to non-covered on the

Line #	Component	Overview	Function	Description
				UB92 based on these checks • Authorized members can view comprehensive patient account information on-line; print bills, statements, claim forms/logs; accept receipts; and provide account follow-up and management reports on demand • Billing procedures may be defined with one code and volume-based standard costs can be entity-specific for each procedure • Revenue and receivables are tracked separately for each facility.
118.			7. Patient and Guarantor Collections	Patient and Guarantor Collections • Account look-ups by patient name and number, guarantor name and number, and Medical Record Number • Detailed workstation displays and printouts which include patient/guarantor demographics and account statuses, patient and insurance balances, transaction details, and follow-up statement histories • Process reminders • Entry of free text and coded comments from the inquiry screen • Generation of letters from inquiry screen • Unlimited generation of form letters for user-specified accounts • Collection Support reports that can be customized by the user • Ability to complete letters, statements, reminders, and transfer to bad debt within a single collection stream defined for each patient account.
119.			8. Claims	Claims • To alleviate edits and reprocessing, claim checks are used to determine if all required information exists on a patient's account prior to printing the claim • An override feature exists on-line in every field on the claim form to produce claims that meet payers' specific requirements • Claim establishment can be based on different insurance and account types such as mother/baby billing, inclusion/exclusion of professional components, "clean claim" data checking, alternate code printing (HCPCS), and exclusion of cross-over claims.
120.			9. Cycle Statements	Cycle Statements A health care organization can generate cycle statements by either account or guarantor. Features include an unlimited number of hospital-defined dunning messages, automatic posting of interest, the capability to set up accounts for messages and place them on hold, the availability of a data mailer format, and guarantor contracts for accounts with extended payment agreements.
121.			10. Standard Management Reports	Standard Management Reports • Operations Summary, displaying all Revenue Cycle activity for a particular date or range of dates • Period-end aged accounts receivable analysis • Revenue reports: Revenue Summary, Procedure Revenue Report, Procedure Period-End Comparison, and Patient Revenue Report

Line #	Component	Overview	Function	Description
				• Charge Exception, Late Charges, and General Ledger reports • Collection reports such as biller and collector worklists, collector performance reports, patient and insurance receivable reports, and third-party logs • Reports may be scheduled to print automatically on a daily, monthly, or period frequency.
122.	Health Information Management	The Health Information Management product ensures quick registration of patients, positive patient identification throughout the organization, and easy ongoing maintenance of accurate medical records. Information is easily retrieved from centralized storage, so patients are spared answering the same questions repeatedly, and staff members have a firm foundation from which to initiate the best possible care. This product furthermore provides the organization the tools it needs to document and monitor quality and environmental issues occurring within facilities, and to conduct confidential research projects. The organization is able to effectively analyze its efforts and devise strategies for improving outcomes and regulatory compliance.	1. Registration	The Registration functionality in MEDITECH's Health Information Management product collects admission and registration data on inpatients, outpatients, emergency room patients, surgical day care patients, observation patients, recurring patients, referred patients, and home health care patients throughout a health care network. The application ensures patient information is formatted uniformly, makes pre-certification and verification checks easier, communicates accurate data throughout the hospital and health care organization, eliminates duplication of effort among multiple departments and home care admissions, and provides an audit trail for managers to maintain quality assurance.
123.				**Inpatient Registration** The Registration functionality includes a wide variety of routines to: • Collect and update demographic data and insurance information • Schedule and pre-admit inpatients • Schedule and pre-register patients to observation account status, and generate separate statistical data from inpatient information • Pre-register clients' patients • Cancel reservations • Generate inpatient admit questionnaires, both long and short forms • Generate newborn admit questionnaires using the mother's information • Enter defaults for newborns • Cancel patient activities and adjust statistics and room changes • Transfer an observation patient to an inpatient • Enter a patient's condition at the information desk • Transfer patients and swap beds • Capture daily care charges • Discharge patients • Send admission notifications • Print a visit history for a patient at the end of a registration • Undo any changes made to a patient's account • Enter room and bed board for appropriate bed assignment • Capture diagnosis codes to support medical necessity.
124.				**Multi-Level Soundex Search** During patient registration, the Registration functionality searches the Master Patient Index to correctly identify a patient. With up to nine levels of search criteria, a patient can be identified even if errors and misinformation are presented during patient contact.

Line #	Component	Overview	Function	Description
				The functionality provides multiple search criteria for locating existing patients within a single facility or within a health care network. Patient identification methods include patient's name, partial name, Social Security number, date of birth, sex, and Soundex search method. Once a patient is selected, patient photographs may be stored on-line and used as another means of identification. All demographic information can be shared among facilities within an enterprise. Once the patient is selected, updates or edits can be made to the demographic recall file from any facility within the enterprise. The enterprise-wide identifier (EPI) automatically updates all medical record numbers representing each facility associated with the enterprise. The EPI is unique and ensures that there is a common means to identify patients at each facility. The EPI is a shared database of demographic, insurance, and clinical visit history information for every patient across the continuum of care.
125.				**Access Current Information** Registration officers and information receptionists can access up-to-the-minute information for each inpatient throughout the health care network, such as: • Name, account number, unit number, admission status, location, and physician • Enterprise-wide numeric identifier • Admission questionnaire information • Current condition • Admission activity, such as transfers and previous discharge • Charges and credits • Pre-certification data.
126.				Management Reports The functionality organizes the health care organization's patient and census information into a variety of management reports, such as: • Registration, Discharge, and Transfer Registers Report by name, account number, or time • Alpha, Doctor, and Nursing Unit Census • Billing, Billing Office, and No Show List • Scheduled Registration List by name, service, or priority • Discharge and Transfer Registers • Occupancy Summary Report by service or location.
127.				**Outpatient Registration** The functionality allows either centralized or decentralized data entry for recurring, referred, and clinical outpatients. Features include: • Outpatient scheduling, pre-registration, and registration • Cancel reservation • Client Billing/Short Form generation

Line #	Component	Overview	Function	Description
				• Enter and edit of revisit dates for recurring outpatients • Automatic discharge for recurring outpatients • Edit and view outpatient data • Ability to process multiple referral requests for a single patient visit • Warning displayed to the user when he attempts to pre-admit/register a patient who has at least one existing pre-admitted/registered account.
128.				**Outpatient Reports** The functionality allows users to create outpatient reports on demand. Reports include: • Daily List by name, hospital location, account number, or service time • Discharge List for Recurring Outpatients Report • Census List for Recurring Outpatients Report.
129.				**Emergency Room Registration** Emergency room (ER) patients are handled through a separate set of features, including: • ER patient pre-registration and registration (both long and short forms) • Cancel reservation • Cancel patient activities and adjust statistics • Edit and view ER patient data • ER reports • Automatic transfer of a patient's demographic and insurance data to inpatient or observation status.
130.				**Surgical Day Care Registration** The functionality also handles the special requirements of surgical day care (SDC) patients. Features include: • SDC schedule, pre-registration, and registration • Cancel reservation • Cancel patient activities and adjust statistics • Edit and view SDC patient data • SDC reports • Automatic transfer of a patient's demographic and insurance data to inpatient or observation status.
131.				**On-Line Insurance Eligibility Verification and Authorization** The functionality accommodates on-line eligibility and authorization verification at the point of registration. This feature can easily accommodate different verification methods. MEDITECH's Managed Care enrollment database allows immediate access to a complete list of both new and existing members. Enrollees' insurance information may be loaded electronically via downloads from insurance providers, while eligibility and verifications can be checked on-line at the point of registration. Electronic access via ANSI 270 and 271 interfaces that link directly to third party eligibility databases allow for on-line verification and eligibility checks.

Line #	Component	Overview	Function	Description
132.				**Observation Patients** The functionality accommodates the registration of observation patients, allowing the organization to assign rooms and beds to non-inpatients. If appropriate, the system can easily change inpatients to observation patients and vice versa. Features include: • Observation patient admission and discharge • Cancel patient activities and adjust statistics • Change observation patient to inpatient • Change inpatient to observation patient • View and print patient information • Observation Patient Census Report.
133.				**V.I.P. and Confidential Patients** Patients who may need special attention (handicapped or elderly patients, for example) can be assigned a V.I.P. status. When identified, V.I.P. patients are flagged by the system for immediate recognition by the hospital staff. Patients can also be assigned a confidential status. Only authorized users within Registration are permitted to access information and files of confidential patients. Unauthorized users see only a hospital-defined "confidential" message on inquiries and reports. In addition, the system can be set up to designate entire hospital locations as confidential, such as the psychiatric and chemical dependency units, so that all patients at those locations are automatically assigned a confidential status.
134.			2. Medical Records	The Medical Records functionality in MEDITECH's Health Information Management product provides multiple and single facility health care organizations critical patient identification and medical record functions to integrate care delivery. For each facility in the organization, the application ensures a common means to identify patients and to correctly apply all care information for previously admitted patients. Equally effective in a small organization as it is in a large enterprise, this Enterprise Patient Index (EPI) is a shared database of demographic, insurance, and visit history information for every patient in the integrated care delivery system.
135.				**Efficient Addition of New Patients and Managed Care Members** The functionality allows all providers in your enterprise to add new patients at any time. • New patients can be added by any facility, whether it is using MEDITECH's information system or another vendor's system • All members on the enrollment database are automatically assigned to the EPI. Therefore, demographic and insurance information for all managed care members is on-line at all enterprise facilities before members schedule their first appointments • When a patient visits a facility within the enterprise for the first time, or calls for his or her first appointment, registration and scheduling personnel create a new record. All pertinent demographic and insurance information is collected and then

Line #	Component	Overview	Function	Description
				stored in a central file across the health care enterprise.
136.				**Positive Patient Identification** Positive identification within the EPI eliminates duplicate patients. Some features include: • Providers can search by name, partial name, sex, date of birth, Social Security number, or by Soundex search • At the point of admission, registration personnel have the option to view patient pictures on-line
137.				**Clinical Histories** The functionality also stores basic clinical history information and makes it available to all providers. This first level of clinical information on a patient includes: • A visit history which lists visits, providers visited, and date of visit • A history of the patient's encounters • A list of all the patient's visits, along with the diagnosis associated with each visit. More in-depth clinical information is reserved for the Enterprise Medical Record (EMR). The EMR contains all aspects of clinical information from each visit conducted along the continuum of care. In order to protect patient confidentiality and security, records can be sealed so only specific users will have viewing access.
138.				**Individual Facility Identification** Individual providers across the enterprise maintain the separate patient numbering schemes required at their own facilities. While all providers participate in the enterprise-wide patient identification system, individual facilities also have their own numbering systems for internal management functions. The EPI supports both the facility-specific numbering for individual providers and the universal "one number, one patient" scheme that is crucial for enterprise management. This assures that there is no duplication of patients or confusion in patient identification.
139.				**Process Patient Worklist** The process patient worklist allows users to perform multiple functions on one patient or a list of patients within a single routine. By selecting search criteria, users have the ability to sign out/return records, process incomplete records, and track correspondence requests.
140.				**Tracking Medical Records** From any workstation, users have the ability to locate and review all medical records residing on the HCIS. Patient information can be retrieved from any computerized department within the hospital or at remote sites such as physicians' offices or satellite laboratories. • Record locator functions provide an efficient method for tracking medical records and maintaining on-line data about each recipient. These locator functions: – print reminder letters and reports monitoring location of the records checked out

Line #	Component	Overview	Function	Description
				– enable users to view any record and display the record's current location – generate an audit trail and recipient inquiry – list locator records sorted by terminal digit, recipient, or reservation – enable users to reserve records – allow records to be moved from one location to another without having to return and sign the record out. • Bar code capabilities facilitate record reading and data entry • Linking of the incomplete records and record locator functions expedite tracking of incomplete records and allows for automatic reservations and returns • Batch Sign Out and Reserve Record routines allow users to process records being signed out to a recipient.
141.				**Incomplete Medical Records Check** Medical Records functionality helps users define which records are incomplete and the care providers responsible for completing them. The system generates: • Tallies, by physician, on the number of days each medical record portion is considered incomplete • Notification letters and several lists, including: – Incomplete Record Lists (Days Outstanding, Terminal Digit, or Name) – Doctor Incomplete Lists (Days Outstanding, Terminal Digit, or Name) – Incomplete Record Count – Delinquent Record Count. • A batch routine to expedite the process of completing many records at one time • An audit trail signifying the user, date, and time for incomplete records processing, which lists who entered, deleted, and/or completed a record • A link to transcription features within MEDITECH's Imaging and Therapeutic Services application which allows deficiencies to be automatically generated and completed via electronic signature • Automatic deficiencies for history, physicals, and discharge summaries not transcribed within the facility-defined time frame.
142.				**Correspondence Feature** A Correspondence Feature provides a medical records department an efficient tool for tracking requests for medical information, generating reports for monitoring workflow and revenues, and printing letters and reports of correspondence. These functions allow an organization to oversee the processing of requests for medical information from the time the request arrives at the medical records department to the time a staff member sends the requested information.
143.				**Medical Records Maintenance and Control** Several reports are generated that help health information administrators review activities taking place throughout the health care organization, such as: • Verify Daily Assignments • Unit Number Assignment Log

Line #	Component	Overview	Function	Description
				• Edit Transaction Log • Monthly Logs of New Medical Records • Merge/Unmerge Transaction Log • Duplicate Patient Report • Duplicate Social Security Report • Delete/Restore Log • Missing Data List • Population Count • User Activity Log.
144.			3. Abstracting	The Abstracting functionality in MEDITECH's Health Information Management product collects and reports various patient information, such as prospective payment and Peer Review Organization (PRO) data, as well as data for state and federal reporting requirements.
145.				**Grouper Routines for Managing DRGs** The functionality includes grouper features which automatically calculate DRGs, display patients' DRG data, and provide for easy creation of various reports. The features include: • Ability to assign separate DRG admit statuses, intermediate, and final DRG • Display of reimbursement amount and length-of-stay data • Ability to recalculate the DRG if edits are made to other key fields • Ability to flag patients for concurrent review • Ability to store multiple grouper versions • Concurrent and retrospective coding features available.
146.				**Concurrent Review** A concurrent review feature helps to identify which patients' charges are approaching the DRG reimbursement amounts and/or approaching their DRG maximum or standard length of stay. These reports signify the potential day and cost outliers of those patients still in the hospital. Users may identify any or all of the following criteria: • Patients flagged for review • Patients whose actual length of stay (LOS) is within an organization-specified limit of their assigned LOS • Patients whose actual LOS is within an organization- specified limit of the maximum DRG LOS • Inventory valuation using Average Cost (AVG) • Patients whose actual charges are within an organization-defined percentage of the DRG expected reimbursement amount • Patients whose LOS is an organization-specified number of days before/after their DRG standard length of stay • Patients whose DRG or diagnosis has changed in the previous user-specified number of days • Patients with a particular DRG status

Line #	Component	Overview	Function	Description
				• Transmit UB 92 CPT charge master codes from the Revenue Cycle product to the Abstracting functionality. The functionality includes the ability to create a Final DRG Delinquency Register that identifies discharged patients lacking a final DRG assignment. Test case grouper features allow users to test cases without using actual patient abstracts.
147.				**Utilization Reports** Case Managers perform patient-specific utilization reviews such as quality management and risk management. Reviewers have the ability to: • Collect patient-specific data for pre-admission, concurrent and retrospective reviews • View diagnoses and insurances • Create specific criteria indicators such as severity of illness and appropriateness of admission • Generate letters and messages based upon review outcomes • Generate statistical reports which analyze utilization review data • Create worksheets and collection forms for patient data • Create organization-defined worklists specifically for utilization review.
148.				**Customer-Defined Screens** Users may create and customize their own screens to collect information. If desired, these screens can be set up in the Registration functionality to pass information captured on these screens to the patient abstract.
149.				**Encoding Capabilities** The Abstracting functionality contains coding and grouping functionality through the use of HCFA tables. Sites have the option to connect to other vendor software. Features include: • Ability to pass MEDITECH patient identifying information to other vendor encoder • Ability for MEDITECH to receive other vendor's coding date for automatic inclusion into the patient's abstract profile • A choice of third-party encoding software that is HL7 compliant including 3M, Codemaster, and Medicus. MEDITECH receives the following Ambulatory Patient Group (APG) information for the patient: • CPT codes with APG information attached to them • All APG assignments with associated APCs, cost weights, and APC percentage values • Summary APG assignment • Total charges, outlier dollar value, APG weight and expected reimbursements for the summary APG.
150.				**On-Line Patient Abstracts**

Line #	Component	Overview	Function	Description
				The functionality makes it easy to create, view, and maintain both inpatient and outpatient abstracts on-line. The application pulls selected information on a particular patient from the Registration application to minimize data entry and allow for historical reporting. The system allows users to: • Easily create abstracts from information passed from the Registration application • Display, edit, and finalize abstracts for statistical compilation and tape creation, if applicable • File data automatically • Develop user-defined reports • Print forms such as the Attestation Statement, UR Utilization Worksheet, and Patient Abstract form.
151.				**Abstract Reports** Abstract reporting options ensure that abstracts are completed as soon as possible. Unfinalized abstracts are included in statistical reports to provide more accurate reporting. Users may create reports such as: • Incomplete Abstracts List to note those patients whose abstracts are not final • Expired Patients Report to list those patients who passed away during a user-specified time period • Case Mix Indexing • A listing of all patients involved in a particular special study which the institution is conducting • Report the top ten diagnoses and procedures, including rank and patient counts.
152.				**Project Screens and Special Studies Routines** A group of user-defined project screens included in the functionality enable the organization's staff to establish its own data collection screens for collecting information such as quality assurance, risk management, infection control, and utilization review data. Users can: • Flag special studies • Collect and report on an unlimited number of user-defined queries and responses • Assign an unlimited number of projects to a patient abstract as appropriate • Use the report writer to report on projected data • Limit user access to appropriate projects • Enter the diagnosis and procedures, as well as finalize the abstract, on one screen.
153.				**Optional Features** The functionality allows organizations to incorporate a variety of optional features and routines, including the use of abstract tapes (UIS, PAS, and various other state tapes).
154.			4. Quality Management and Risk Management	Quality Management and Risk Management functionality in MEDITECH's Health Information Management product provides health care organizations the tools they need to document and monitor quality and environmental issues occurring within their

Line #	Component	Overview	Function	Description
				facilities, and to conduct confidential research projects. The functionality includes two distinct components: a Quality Management component which enables health care organizations to improve the quality of services and ensure the overall safety of their patients, visitors, and staff; and a Risk Management component which helps reduce the risk of legal liability and financial loss to organizations. Quality Management and Risk Management pulls data from throughout the MEDITECH HCIS and stores it in a secure database for robust reporting and benchmarking by authorized users. Organizations can thereby track and report on a variety of issues such as patient and visitor incidents, adverse drug events, employee health and safety, blood utilization, and infections with complete confidentiality. The Quality Management and Risk Management functionality enables hospitals to effectively analyze their efforts and devise strategies for improving outcomes and regulatory compliance. The functionality includes standard content and a comprehensive set of standard reports. As a result, organizations can implement the system quickly, and users can access the information they need at the touch of a keyboard.
155.				**Quality Management** The Quality Management component helps health care organizations track quality issues and outcomes for both patients and non-patients. Organizations can compile and report on numbers and data for statistical analysis, benchmarking, and trending.
156.				**Ability to Analyze the Effectiveness of Processes** Quality managers can determine the scope and success of ongoing projects in the facility or organization, in individual departments, and in specific disciplines. For example, hospitals using a CPOE system can compare the number of adverse drug events before and after the introduction of CPOE. Users can prioritize their projects by using impact scoring features. Organizations can: • Define projects and objectives • Determine timeframes • Set targets and measure criteria • Review reporting and referral information • Record actions and associated outcomes • Plan strategies • Track dimensions of performance, as defined by the Joint Commission.
157.				**Ability to Maintain an Inventory of Indicators in Review** Quality Management enables health care organizations to maintain a list of ongoing indicators for Continuous Quality Initiative purposes. Health care organizations may define unique projects in order to monitor and improve the quality of care and services by tracking the indicators over time. They can also pull data into one list for easy review.

Line #	Component	Overview	Function	Description
158.				**Risk Management** The Risk Management component enables health care organizations to track and manage incidents and environmental factors which pose a risk of illness or injury to patients, visitors, and staff. The software includes comprehensive tools to collect enterprise-wide data.
159.				**Ability to Create Employee Notifications** An employee notification feature tracks employee injuries and illnesses, such as lost work days and the details of an injury. Users can set screen preferences based on notification type and define which information will be documented on an incident. Organizations can: • Report on actual versus projected lost workdays • Distinguish an employee's status (i.e., partial responsibility versus full job responsibility) • Generate Occupational Safety and Health Administration (OSHA) logs • Pull employee files from MEDITECH's Payroll/Personnel functionality.
160.				**Complete System Integration** The Quality Management and Risk Management functionality ensures access to a wide range of comprehensive and accurate data from a single screen. The software: • Pulls patient information from MEDITECH's Abstracting functionality and enables users to view data in an electronic medical record • Enables users to access drug dictionaries in MEDITECH's Pharmacy application when compiling ADRs and MUE (Medication Usage Evaluation) reviews. The system's integration streamlines workflow and reduces manual tasks. Information from the HCIS flows into the compiled report writer feature to populate worklists, thereby helping to improve workload management.
161.				**Comprehensive Reporting and Benchmarking** Organizations can perform comprehensive reporting and benchmarking through: • Standard reports, such as blood review summaries, physician profiles, mortality rates, and lost workdays • Custom views • Compiled reports, such as Laboratory, Pharmacy, and Nursing • Trending of statistical data. These features enable health care organizations to effectively analyze quality and patient safety initiatives. Organizations can also use the software to help meet Joint Commission and OSHA reporting requirements.
162.				**A Secure Database to Ensure Confidentiality** The Quality Management and Risk Management functionality has its own secure database, to ensure the highest level of confidentiality. While information from the HCIS flows into Quality Management and Risk Management, it does not flow back out to other applications. Organizations can define and control access to the data in

Line #	Component	Overview	Function	Description
				numerous ways, such as assigning only certain pages or a particular task to a given employee.
163.	Laboratory and Microbiology	The powerful clinical products afford flexibility to maintain both core and independent laboratory functions in the organization. Laboratory software streamlines workflow and eliminates time-consuming paperwork throughout the laboratory, including Microbiology. Lab instrument interfaces are included in the product.	1. Laboratory	The Laboratory functionality in MEDITECH's Laboratory and Microbiology product improves the speed and accuracy of lab work - from requisitioning through final reporting - by eliminating time-consuming paperwork and delivering information to physicians quickly and efficiently. As caregivers gain easier access to lab results and reports, patient safety is improved and costs are reduced.
164.				**Rules-Based Logic** Rules-based logic capabilities can be applied to many laboratory functions. Laboratory personnel define criteria in "if-then" statements. These rules help technologists establish, perform, and maintain laboratory and organization-wide policies and procedures, while ensuring the patient receives safe, quality care. Some of the major functions are: • Order logic /criteria • Site rules • Reflex testing • Charge rules • Purge rules • Reporting logic • Calculation rules.
165.				**Network-Wide Requisition Entry** Laboratory staff members order tests and assign collection categories with requisition entry routines. Users have the ability to perform several tasks from one screen, including: • Ordering for past or future dates • Placement of network orders from various sites, including physicians' offices, off-site clinics, and emergency rooms • User-definable reflex testing, series orders, and automatic group testing • Workload crediting for specimen collection • Addition of unlimited lines of free text or coded comments • Charge capture at time of order, resulting, completion, or specimen collection • Automatic credit issue • Duplicate order checking • Evaluation of order rules.
166.				**Specimen Collection and Verification** MEDITECH's Laboratory functionality streamlines the specimen collection and verification process with: • User-definable barcode collection labels • Automated specimen storage • Phlebotomy handheld to ensure positive patient identification and accurate data collection

Line #	Component	Overview	Function	Description
				• Multisite tracking • Unlimited, user-defined collection categories for timed draws • Efficient specimen processing by receipt of individual specimens or of an entire batch • Re-collection and reprint label capabilities • Specimen collection time and user automatically captured from Order Entry when "Collected by Nurse" (CBN).
167.				**Specimen Processing Screens** Process screens allow users to access multiple functions for multiple patients and specimens from one screen. • Specimens arranged by priority • Unlimited sequencing of quality control and patient specimens • Result entry for worksheet batches via process screens • The ability to define tasks which are automatically associated with laboratory worksheets, such as instrument maintenance • Rules-based logic for inclusion/exclusion of specimens in a batch.
168.				**Result Entry** Staff has the ability to enter results via workstations, on-line automated analyzers, and user-defined result entry screens. • Result entry by specimen, patient, worksheet, or processing screens • Propagation of results within spreadsheets • Delta checking, reflex evaluation • Interpretive comments by test result value • Workload automatically captured • Reference laboratory interface available.
169.				**Result Verification** The Laboratory functionality helps streamline the result verification process and ensure the accuracy of results reporting. • Test results withheld from reporting until verified • Verification of profile components with results released individually • Immediate broadcast of results to a patient location by user-defined criteria (test, location, priority) • Edited results automatically reported with corrected comments • Automatic paging of physicians via cell phones or pagers.
170.				**Result Inquiry** Laboratory personnel can perform real-time, on-line inquiries by physician, date, test, patient name, billing number, Medical Record Number, partial name look-up, specimen number, or laboratory test. • Results delivery based on user-defined criteria • Results available in the Electronic Medical Record or over the Internet.

Line #	Component	Overview	Function	Description
171.				**Patient Reports** A series of standard and user-defined formats is available to users by activity or summary. • Cumulative summaries by location, care provider, and patient, as well as complete discharge summaries • Reports can be automatically printed, faxed, and e-mailed.
172.				**Management Reports** A series of flexible management reports help laboratories to capture information easily and efficiently. Management reports include: • Specimen review reports • Outstanding specimen and pending specimen reports • Exception reports • All management reports can be scheduled to automatically compile and print.
173.				**Quality Control** Quality Control (QC) features enable organizations to monitor the accuracy of test results. • QC automatically ordered and captured via analyzed routines • QC specimen requisition and result entry features • QC analysis reports, including: – Levy-Jennings Plot with data summary – On-line Cumulative Summary and Youden graphs – Exception QC Results Report – Daily Log – Summary Report for user-selected date ranges – Multi-Rule Log for controls exceeding acceptable ranges.
174.				**Workload and Result Statistics** Extensive statistical routines allow technologists to: • Capture workload • Create and capture population studies based on age, gender, test methodologies • Evaluate turnaround times.
175.			2. Microbiology	The Microbiology functionality in MEDITECH's Laboratory and Microbiology product streamlines workflow and eliminates the time-consuming paperwork associated with processing microbiology specimens. Staff members benefit from easy access to previous results, robust reporting capabilities, and seamless integration with MEDITECH's Pharmacy application.
176.				**Network-wide Requisition Entry** Laboratory staff is able to order tests and assign collection categories with requisition entry routines. The rules-based logic inherent in our Microbiology functionality evaluates appropriate order criteria and performs duplicate checking. Furthermore, source and description information can be required, ensuring appropriate specimen handling. Users have the ability to perform an unlimited number of tasks from one

Line #	Component	Overview	Function	Description
				screen, including: • Medical Necessity checking • Placing orders throughout the HCIS • Reflex and automatic group testing based on user-defined criteria • Automatic patient billing.
177.				**Collection Lists** The Microbiology functionality facilitates the process of collecting and receiving specimens by enabling technologists to quickly create collection lists and verify the receipt of specimens in the laboratory. The functionality provides several timesaving features: • User-definable specimen and collection list labels • Ability to generate barcode labels for specimens • Collection lists and labels printed in room number order for a geographically efficient collection route.
178.				**Batch Processing** The functionality offers unlimited user-defined worksheets and process screens that organize specimens for processing, allowing for streamlined, efficient entry of results. • Ability to generate worklists based on user-defined criteria • Auto-default of results, based on procedure and time • Result entry and other specimen processing routines via process screens • Ability to define tasks, such as instrument maintenance, and associate them with a work batch • Rules-based logic for inclusion/exclusion of specimens in a batch • On-line specimen review.
179.				**Result Entry** Users are able to enter, edit, and verify results for patient and quality control specimens individually or by batch. • Result entry via workstations, automated analyzer, and user-defined entry screens • Default resulting by procedure and fixed or elapsed time • Reflex testing for automatic ordering and deleting of tests and procedures • Susceptibilities determined based on appropriate protocol, organism, and body site • Preliminary results may be released prior to report finalization • Intuitive resulting assists users in standardizing procedures and performing confirmatory testing • Appropriate addition of additional testing for organism identification • Procedure-specific screens lead technologists through procedures • Comprehensive audit trail details all work performed.
180.				**Result Inquiry** Staff members review results and specimen statuses on-line via multiple inquiry features.

Line #	Component	Overview	Function	Description
				• Results can be accessed by patient name, physician, location, account number, specimen number, or procedure • On-line results are immediately available through the Electronic Medical Record.
181.				**Epidemiology and Statistical Reports** Microbiology organism and infection control reports can track the presence and/or spread of potentially infectious organisms in your health care organization. • Infection Control Reports compile data for patients where potentially infectious organisms have been isolated and automatically capture information such as location, susceptibility, and source of infection • The Organism Isolated Report identifies the number of times an organism was isolated over a period of time, as well as location of the isolated organisms - the susceptibility of an organism can also be graphed over a user-specified period or date range • The Antibiogram Report identifies the percentage of organisms susceptible to particular antibiotics.
182.				**Management Reports** The Microbiology functionality provides a series of internal reports that help health care organizations maintain efficient processing of microbiology specimens. One report, for example, records the laboratory's activities - both complete and incomplete - and isolates microbiology specimens that require special attention. Other reports include: • Comprehensive management reports • Multifacility selections across the IDN • Flexible data and statistical reporting • Extensive quality control reports.
183.				**Workload Statistics** Labs can compile workload statistics to analyze the total effort required to perform microbiology procedures. These statistics take into account clerical functions, the technologists' time, and the equipment and supplies necessary to perform the procedures
184.				**Integration Features** The comprehensive, seamless integration of MEDITECH's Health Care Information System further streamlines the processing of microbiology specimens. • Integration with MEDITECH's Pharmacy application gives technologists and pharmacists access to appropriate clinical information for better decision making • Antibiotic date, time, and dose information is available • Clinical alerts flag appropriate personnel if a patient is on inappropriate antibiotic therapy • Real-time susceptibility information is available in Pharmacy • Procedure data and results can be evaluated by physicians at the time of order entry.

Line #	Component	Overview	Function	Description
185.			3. Outreach Laboratory	MEDITECH enables outreach labs to operate efficiently and profitably by reducing turnaround times and streamlining workflow. Lab staff has more time to perform tests, so clients receive results more quickly, while the lab has more time to work on a larger base of clients.
186.				**Streamlined Requisitioning** Your outreach lab is able to accession specimens efficiently and accurately. The requisitioning process is streamlined through the staff's ability to: • Quickly enter orders with abridged patient information • Register patients and assign medical records, if necessary, through the LIS after accessioning, reducing front end paperwork • Preprint bar coded client requisitions and labels, eliminating the need for relabeling once in the laboratory, thereby reducing errors • Provide clients with the option of maintaining their own numbering wheel and patient identifiers • Perform Batch Requisitioning for "Mall or Fair" screening • Check Medical Necessity at the time of ordering.
187.				**Flexible Billing Procedures** Integration between our Lab system and the Revenue Cycle application helps outreach labs to smoothly and effectively handle patient and client billing, improving timely payment of lab invoices. Our flexible billing procedures give you the ability to: • Bill independently or integrate with the hospital's billing system • Utilize unlimited fee schedules, allowing your lab to offer each client specialized rates and discounts • Have charges automatically flow to Revenue Cycle when demographic information has been entered completely • Reduce AR days.
188.				**Ability to Track and Document Call Backs** Staff can systematically call specimen results to clients, then track and document those calls by using free or canned text. Call backs can be determined by: • Requisition • Result • Specimen priority • Technologist intervention • Client criteria or parameters.
189.				**Future Orders Database** Staff can easily create placeholders for future requisitions, allowing managers to track upcoming orders and determine workloads. Staff is able to: • Create single and series orders • Enter an order, although certain patient and specimen information may be

Line #	Component	Overview	Function	Description
				unavailable at the time • Automatically cancel uncollected orders, after a predetermined period of time • Avoid having future orders appear on pending logs • Renew expiring series orders • Provide warnings when a series is complete.
190.				**Comprehensive Reporting Options** Managers have access to a variety of reports, enabling them to provide clients with the information they need, in the format they desire, when they need it. Managers can quickly and efficiently: • Handle multiple client addresses for reporting • Create client-centric reports, such as statistical, workflow, and patient reports • Determine how reports should be distributed (i.e. fax or e-mail).
191.				**Flexibility to Integrate with the MEDITECH HCIS** Outreach labs have the option to integrate lab results with the patient's medical record in the MEDITECH System. The inherent flexibility of our LIS gives your lab the ability to: • Have certain patient results populate the electronic medical record • Assign Medical Record Numbers • Provide clients with on-line access to results.
192.	Anatomical Pathology	MEDITECH's Anatomical Pathology application automates the data handling needs of the Pathology department with features for recording, storing, coding, searching, and reporting pathology cases. MEDITECH's integrated system gives users the ability to view Radiology reports with a case. In addition, integration with the Laboratory application allows pathologists to view lab results pertinent to the case, and to integrate relevant data into the report. Pathologists and other users can utilize voice recognition, sign out cases using on-line electronic signature, and search the Pathology database to generate user-defined statistical reports.	1. Specimen Processing	Specimen Processing Staff members can quickly enter specimens, which may include defaults for procedures, tissues, blocks, levels, and data fields needed to capture detailed information on the case. Specimen processing features include: • Requisitioning tailored to the needs of the Pathology department • User-defined data fields for collecting patients' clinical histories, surgical procedures, comments, and other details on the case • Duplicate order checking by order and/or department • Immediate access to related findings • Ability to view Radiology reports while entering the case • Slide tracking management.
193.			2. Result Entry	A variety of resulting routines allow staff members to enter and edit findings for individual cases or batches of cases. Related findings are readily available while entering results on cases. Authorized personnel have the ability to sign out cases utilizing password-protected electronic signature capabilities. Result entry capabilities include: • Entry of case results via voice recognition or transcription • User-defined report formats • Easy-to-use word processing with MEDITECH's own text editor or Microsoft Word • Automatic SNOMED Concept Coding or user-defined coding schemes

Line #	Component	Overview	Function	Description
				• Automatic addition of case markers based on terms, procedures, or diagnosis • Rules-based logic determines fields and procedures based on case type • Test View Group routines to allow users to associate laboratory tests, microbiology procedures, or blood bank tests with a case • Worklists, questionnaires, and logs can be created to meet specific needs • Quality Assurance Review routines and statistics.
194.			3. Sign-out	Pathologists have the ability to define specific criteria for cases to be pulled into a batch sign-out routine. Multiple cases can then be reviewed and signed out utilizing a batch routine, which attaches a password-protected signature to finalize the document. Individual sign-out is also available in an electronic or manual mode.
195.			4. Patient Reports	Patient reports are user-defined; laboratories can tailor the format and content of reports to meet organizational criteria and needs. Reports can be printed in a rich text or a Microsoft Word format.
196.			5. Search and Statistical Routines	The system contains powerful routines for user-defined searches and statistical analysis of the Pathology database. Users can search for tissues, words, prompts, procedures, markers, codes, queries, or SNOMED concepts. Search and statistical results can then be maintained on-line for a user-defined period of time.
197.			6. System Reports and Statistics	The Anatomical Pathology application also provides a series of internal reports to help organizations maintain an efficient laboratory operation. Pathology departments have considerable flexibility to create reports and determine their formats. The application also compiles specimen, turnaround time, and transcription and workload statistics to analyze the total effort required to perform a test. Management reports include: • Patient Master Log • Outstanding Specimen Report • Patient Follow-up Letters • Patient Follow-up Report • Marker Reports – Tumor/Conference & Other • Slides Read Report • Specimen Statistics • Workload Statistics • Specimen Master Log • Turnaround Time Statistics • Exceptions Report • Quality Assurance Review Report • Quality Assurance Statistics Report • Diagnosis Report • Correlation Report • Transcription Statistics.
198.	Blood Bank	MEDITECH's Blood Bank application tightly integrates	1. Historical Record of Information	MEDITECH's Blood Bank application is designed to be a historical module that allows organizations to maintain a permanent on-line record of:

Line #	Component	Overview	Function	Description
		donor, unit, and patient history information with data in the health care information system (HCIS). The application - which has received FDA clearance - flags abnormal test results, reports test and transfusion results, minimizes product waste, utilizes expert rules when recording, and performs error checks. It also generates turnaround time and workload statistics, compiles statistical reports, and automatically captures charges. Authorized users have the ability to view blood bank results from within the network or remotely. All of these features ensure patient safety and reduce turnaround times.		• Donors and patients • Transfused units • Antigens/antibodies • Transfusions.
199.			2. Donor Recruitment and Management	Donor recruitment and management features include: • Ability to maintain blood types, antigen/antibody profiles • On-line tracking of donor schedules and information • Ability to evaluate criteria, check eligibility, and schedule appointments • On-line donor recruitment phone lists and letters • On-line, user-defined donor questionnaires to stream line the qualification process • User-defined error checking logic allows staff to compare current information against data collected during the donor's last appointment • System automatically generate deferrals when donors do not meet eligibility requirements • Ability to generate donor statistical reports.
200.			3. Inventory Tracking and Utilization	MEDITECH's Blood Bank application allows for comprehensive inventory management by tracking physical inventory as well as inventory utilization, based on pre-transfusion data. All transfusable products are tracked from the time they are entered into inventory through final disposition. Features include: • Ability to scan units into the inventory, either by individual unit or in batches • Automatic requisitioning for blood bank and serology tests via MEDITECH's integrated system • Look back functionality assuring patient safety • Comprehensive inventory management reporting tools.
201.			4. Multiple Specimen Processing	Electronic worksheets and process screens can replace the worksheets used to manually enter test results for specimens and units, creating streamlined and efficient processes, ensuring accurate information and improving patient safety. Features include: • Preview feature showing specimens and tests in batch format • Automatic release of crossmatches using rules-based logic • Process screens to quickly result and efficiently track unit status • Ability to efficiently process multiple units or specimens at one time.
202.			5. Patient Reports	Standard and user-defined formats are available for activity or summary reports. Features include: • Summary and activity reports by physician, patient, or location • Discharge and extended summaries • Results available electronically via the Electronic Medical Record and over the Internet.
203.			6. Reporting Capabilities	MEDITECH's extensive reporting capabilities ensure that procedures are followed and cost effectiveness is maintained. Examples of reports include:

Line #	Component	Overview	Function	Description
				• Outstanding Specimen Report • Transfusion Report • Inventory Reports • Unit Disposition • Overdue Warning Report • Unverified Results Report • Crossmatch/Transfusion Ratio Statistics by location or provider • Utilization Reports to assist in reviewing and ensuring appropriate use of products.
204.	Oncology Management	MEDITECH's Oncology Management product is a comprehensive system designed to help organizations manage the unique care requirements of oncology patients, who often require lengthy treatments and frequent treatments at ambulatory facilities. The product serves a wide range of clinicians and staff members including oncologists, practice assistants, practice nurses, treatment room nurses, pharmacists, clinical research nurses, intake coordinators, social workers, and secretaries. It includes features for scheduling patients, managing treatment plans and orders, TNM and Staging, documentation, and chemotherapy ordering, as well as a radiation therapy interfaces and extensive integration with the MEDITECH HCIS. Organizations that use MEDITECH's Oncology Management system benefit from a streamlined workflow, improved patient safety, and a	1. Appointment Scheduling	The Oncology Management product includes a scheduling component to coordinate appointment scheduling. These scheduling features help users to: • Automate and streamline patient appointment scheduling • Minimize scheduling errors and missed appointments • Perform conflict checking by resource, personnel, and appointment type • Generate automatic appointment reminders and cancellation notices • Utilize waitlists to minimize/eliminate unproductive time due to cancellations • Improving scheduling efficiency and resource allocation.
205.			2. Order Management	Oncologists are able to manage orders for patients treated their outpatient chemotherapy clinics. Powerful decision support features help clinicians to ensure a safe ordering process. Capabilities include: • Multidisciplinary ancillary orders • Chemotherapy ordering (including lifetime dose checking) • Ambulatory orders and prescriptions.
206.			3. Clinical Flowsheets	Oncologists can utilize a patient-centric flowsheet to format treatment cycle dates and other vital information, including: • Vital signs • Laboratory work (both internal and external results) • Chemotherapy and radiation treatments and modifications • Premedications • Transfusions • Hydration • Ancillary medications • Progress notes/reports.
207.			4. TNM and Staging	MEDITECH's Oncology Management product provides clinicians with an on-line version of the American Joint Commission on Cancer (AJCC) TNM and Staging Forms used to document tumors, the extent of spread to lymph nodes, and any metastasis. Knowing the state of the disease helps the clinician plan a treatment and determine a prognosis. Staging provides a common language that clinicians can use to communicate a patient's case. Knowing the stage is important to identifying clinical trials that may be suitable for a particular patient.
208.			5. Interfaces for	A suite of interfaces is included in the product for communicating with other vendors'

Line #	Component	Overview	Function	Description
		consistent and managed approach to oncology treatments.	Communication with Radiation Therapy Systems	radiation therapy systems. These interfaces enable users to: • Communicate scheduling requests from MEDITECH's Oncology Management product to the radiation therapy system • Communicate radiation prescription information and TNM and Staging information from MEDITECH's Oncology Management product to the radiation therapy system • Receive treatment summaries from another vendor's radiation therapy system into MEDITECH's Oncology Management product.
209.			6. Integration with a Wide Range of MEDITECH Products	MEDITECH's Oncology Management product is integrated with a wide range of MEDITECH HCIS applications to ensure coordinated care delivery. These applications include: • Health Information and Quality Management • Revenue Cycle • Patient Care and Patient Safety • Laboratory and Microbiology • Anatomical Pathology • Blood Bank • Pharmacy • Imaging and Therapeutic Services • Enterprise Medical Record • Physician Care Manager.
210.			7. Recommended Complementary Products	MEDITECH has enhanced its Patient Discharge Instructions and Patient Education and Internet for Patients products to support the treatment of oncology patients. MEDITECH recommends that customers who license the Oncology Management system acquire these products to help patients understand more completely their conditions and the treatments they are receiving.
211.	Pharmacy	MEDITECH's robust Pharmacy application enables pharmacists across the health care enterprise to perform their daily activities efficiently and effectively. The various tools and routines simplify and expedite processes while ensuring safe, quality care for patients. The Pharmacy application can be used in many different health care settings, including acute care, long-term care, behavioral health, residential care, nursing homes, and assisted living facilities. The Pharmacy application meets HIPAA and	1. Increased Patient Safety	MEDITECH ensures patient safety by notifying users of medication issues and errors with warnings, messages, and communication notices. Patient safety features include: • Automatic dose, medication, and condition/disease safety checks • Additional dosing checks based on maximum dose (independent of patient size), as well as condition, age, and gender, thereby preventing overdose errors • Allergy and adverse drug reaction information, which is maintained across visits and used to perform safety checks during medication ordering and administration • Checks for drug interactions, incompatibilities, and duplicate medication orders • Ability to use rules-based logic when ordering, dosing, filling, and refilling medications to supply additional warnings, flags, and messages throughout the system, thereby improving clinical-decision making.
212.			2. Workload Management	MEDITECH's unparalleled integration allows staff to process all medications from one flexible area. All the information and tools needed are at the end user's fingertips. Workload management features include: • Ability to review and process orders all from one portal

Line #	Component	Overview	Function	Description
		The Joint Commission guidelines.		• Ability to utilize one routine for processing all patient and order types, such as inpatient or outpatient orders, nursing home patients, and IV and oral medications • Immediate access to Lab results associated with the medications being ordered or reviewed • Ability to combine medications, dosages, and directions into standard order sets, thereby streamlining order entry • Access to the patient's electronic medical record right from the desktop • Ability to document clinical interventions, adverse reactions, and progress notes all within the single order processing area • Ability to compile reports and statistics from the same work area • Ability for users to access their customized desktops from any network device as well as remotely • Access to customizable menus based on responsibilities to streamline workflow.
213.			3. Accessible Clinical Information and Monitoring of Treatment Regimens	Pharmacists experience real-time results with clinical decision support tools, which give them the following: • Ability to access Laboratory data during order entry with additional capability of re-evaluating lab data when running fill lists • Rejection of medication ordering and/or dispensing based upon out-of-range Lab data • Ability to ensure proper dosing by viewing calculated dose suggestions based on the patient's weight, body-surface area, and/or condition • Clinical notifications provide caregivers with automatic warnings when clinical information deems it necessary • Ability to monitor patient care with drug utilization evaluations while the patient is receiving the medication • Ability to receive notice of patients not meeting specified criteria to ensure safe administration, allowing the pharmacist to make recommendations while they are still in their care.
214.			4. Minimized Charge Adjustments	Staff can reduce the time spent making cumbersome charge adjustments by controlling what constitutes charges and when charges are posted to the patient's bill. Features include: • Formulas defining the basis for the charge, percent mark-ups, minimum charges, and handling fees • Charges which are sent automatically to Billing, thereby reducing the paper trail • Charge capture, which can occur at administration or dispensing.
215.			5. Enterprise-wide Inventory Control	Health Care Organizations can pull together disparate inventory tracking systems using these connecting tools and technologies: • A standard interface to a variety of dispensing machines, which allows for two-way communication of data • Automatic generation of purchase orders for vendor submission when minimum stock levels are reached

Line #	Component	Overview	Function	Description
				• Bar coding capabilities to update stock levels and manage inventories.
216.			6. Comprehensive Management Tools and Reporting	Extensive reporting tools give managers access to important information in a coherent and easy-to-read format, ensuring efficient Pharmacy management. These include: • Drug Utilization Statistics which identify drug usage and revenue statistics for a selected month and fiscal year-to-date to evaluate areas of fiscal interest • Medication ordering reports to identify ordering statistics and trends • Drug Utilization Review to identify what medications are being administered for certain conditions • Clinical Interventions which isolate interventions needing to be updated or resolved • Adverse Drug Reaction report which captures serious issues and allows for clinical review • Allergy reports which identify to Pharmacy which allergies and adverse reactions need to be updated • Variance reports which identify appropriate/inappropriate administration practices • Workload statistics to evaluate the need for increased or decreased FTE's in a department • Medication Administration Records which can be printed within Pharmacy or to a desired Nursing station • Nursing worksheets, which provide a paper copy of the medication record when documenting electronically • Expired Rx List that can be used during rounds to see if medications should be renewed • Monographs, allowing clinicians to review medication information and provide education to patients • User-friendly ad-hoc reporting tool, allowing for pre-defined search criteria and manipulation of information on the fly.
217.			7. Integration Features	Using Pharmacy in conjunction with other MEDITECH applications offers many additional benefits and provides enhanced access to information. Some of these benefits include: • Immediate communication of orders to the department, regardless of point-of-entry such as CPOE, Nursing, Order Entry, and Pharmacy Order Entry • Complete and comprehensive enterprise-wide electronic record populated from information captured throughout the enterprise • Flagging of Lab information during order entry and processing, ensuring enhanced communication • Microbiology reports from Lab, showing sensitivity and resistance to antibiotics as well as antibiotic costs • Improved workflow by allowing pathway to Medication Administration documentation • Full support of J-code billing in conjunction with MEDITECH's Revenue Management solution • Ability to track and manage quality and safety issues, such as ADRs, through

Line #	Component	Overview	Function	Description
				integration with MEDITECH's Health Information Management application.
218.			8. Dispensing Machine Compatibility	Linking MEDITECH's Pharmacy software with dispensing machines helps to support medication tracking management. Benefits include: • A dynamic, two-way flow of real-time patient and medication information • Notifications sent to the Pharmacy system regarding medication dispensed, medication returned, machine load/unload, and inventory count • Notifications sent to the dispensing machine regarding medications ordered for the patient, and new/deleted drug dictionary entries • Tight inventory control due to a link between medication administration and dispensing • Ability to manage inventories on the location, site, facility, and enterprise level.
219.	Imaging and Therapeutic Services	MEDITECH's Imaging and Therapeutic Services application expedites information capture and communication throughout the enterprise. Radiology, Mammography, and other departments that use textual result reporting methods benefit from streamlined routines and robust reporting capabilities.	1. Patient Exam Coordination	MEDITECH provides robust tools for all of your order entry and processing needs. Exam management features include: • Dynamic on-line work-list providing rapid access to important patient information • Rules-based logic communicating exam-specific information and warning users of procedure conflicts • Schematic diagrams, digital pictures, and scanned images enhancing communication • Audit trail tracking all entries and edits to patient information, ensuring confidentiality.
220.			2. Solutions to Ensure Financial Control	Billing is made quick and easy with routines to capture and track charges. Tools to expedite and reduce loss during the charging process include: • Automatic charge capture at exam entry, processing, completion, report entry, or Electronic Signature • Timed charge capture • Multi-patient batch charging and crediting • Billing lists, patient billing activity, discrepancy list, and other standard management reports.
221.			3. Robust Tracking Capabilities	Improve turn-around time and enhance access to information by tracking and monitoring patients online. Features include: • User- and device-specific sort ensuring accurate communication • The tracking and display of patient location, wait time, priority, and procedure status • Color-coded wait time and status, improving readability.
222.			4. Dynamic Result Reporting	Result reports are easily created by departments using diverse tools. Options to expedite and improve result reporting include: • MEDITECH's Text Editor with industry-standard word processing tools • User-specific coded comments to insert common phrases and terms to expedite report entry • Incorporation of schematics, pictures, digital photos, and scanned pictures • Automated print routing that can be easily adjusted on the fly

Line #	Component	Overview	Function	Description
				• Accelerated creation of normal reports using bar coding • Rapid access to voice recognition software • Easily adjustable exam history questionnaire • Automatic communication of abnormal results via worklist, pager, printing, and e-mail.
223.			5. Tools for Patient Retention	Enhanced tracking solutions ensure patient returns for follow-up visits. Solutions include: • Tracking of Bi-Rad codes including result codes (Category I - V), follow-up codes, and outcome codes • On-line follow-up tracker for compilation of abnormal exams and exams requiring follow-up • Patient contact tracker to easily record communication with patient • Automated patient and provider letter generation as determined by required follow-up
224.			6. Efficient Electronic Signature and Tracking	Simplified Electronic Signature accelerates the communication and accuracy of finalized reports. Functionality includes: • Multiple report verification with a single PIN entry • Single click signing, skipping, editing, and printing of reports • Electronic communication tool with transcriptionist • On-line peer review by other physicians.
225.			7. Comprehensive Management Reports and Statistics	Reporting tools give managers access to important information in a coherent and easy-to-use format. Some standard reporting options include: • Order reports, including cancelled, duplicate, overdue, and incomplete procedures, as well as a daily log • Statistical reports including workload and comparative statistics • Management reports including Final Day Sheet, No Show List, Inventory List, Activity List, and Audit Trail • Easily adjustable ad-hoc reporting • Accuracy statistics automatically generated from captured Bi-rad codes.
226.			8. Film and Material Maintenance	Record locator routines efficiently track all records lent inside and outside of a health care organization. Record locator includes: • Check-in/out and reserve master jackets, sub-jackets, and orders • Automatically queued reminder letters for overdue films • Dynamic tracking tool to simplify the location of film • Bar-coding compatibility, which expedites all film tracking routines • Tracking of film and other materials used during exam.
227.			9. Integration Features	Using the Imaging and Therapeutic Services product in conjunction with other MEDITECH applications offers many additional benefits and provides enhanced access to information. Some of these benefits include: • Ability to schedule appointments from department or from anywhere in the system

Line #	Component	Overview	Function	Description
				• Instantaneous communication of patient information to the Enterprise Medical Record • Ability for orders entered throughout the enterprise to be transmitted automatically to department • Flagging of lab information during order entry and processing, enhancing communication • Streamlined workflow with the ability for Pathology to update Bi-Rad codes • Medical Necessity checking and capture of CPT-4 modifiers at scheduling and order entry • Quality issues and outcomes tracking for patients and non-patients with Quality Management.
228.			10. Image Viewer Compatibility	Image Viewer Compatibility MEDITECH offers a flexible information system that functions with the image viewing systems of your choice via a bi-directional interface. The interface suite includes: • Communication of status information from PACS, EKG, or other image source • Ability to link to patient-specific image from ITS and the Electronic Medical Record • Ability to invoke image during Electronic Signature, and while accessing order or report • Transmission of demographic, exam, and report information to image viewing system.
229.	Operating Room Management	MEDITECH's Operating Room Management application is designed to provide functionality for all aspects of running a hospital operating room including: • Materials management • Scheduling • Clinical documentation • Complete statistical and reporting capabilities. In addition, the system automatically calculates billing charges based upon a set of rules established by the individual organization.	1. Scheduling	The application accommodates all aspects of scheduling by: • Scheduling the visit, physician, room, and equipment from a single entry point • Checking for scheduling conflicts with: – patient's schedule – physician's schedule – equipment availability – room availability. • Calculating the average time it takes each physician to perform a specific procedure • Maintaining physician privileges/specialties on-line • Maintaining patient's confidential status during scheduling based upon Registration parameters.
230.			2. Preference Cards	Preference cards provide support to surgeons with features such as: • Real-time updating and changing cost analysis • Continuous analysis of surgical suite inventory and cost management • Reports for analyzing usage and turnover • Implant tracking routines: – document implant in the patient's profile – track device expiration date – records device serial number – continuous analysis of surgical suite inventory and cost management

Line #	Component	Overview	Function	Description
				– simplified "Just-In-Time" inventory through picks generation list.
231.			3. Surgical Profile	Surgical Profile features include: • Ability to view nursing assessments from pre-testing to recovery • Routines for identifying and maintaining patient risks for future care • Reports for capturing outcome data used in risk management and quality assurance • Ability to document deferred cases.
232.			4. Documentation	The application allows users to document the entire perioperative episode. The system automatically captures who entered the information and the time of documentation. The information that is entered becomes part of the patient's surgical profile, as well as part of the statistical database of operating room events.
233.			5. Reporting	Some standard reports included in the application include: • Operating lists • Daily log • Acuity lists • Delayed cases • Unplanned cases • Procedure counts • Complications reports • Anesthesia reports • Block utilization • Surgical profile audit trail. An additional Compiled Report feature allows users to create their own reports.
234.			6. Billing	The application also provides facilities with the ability to automatically generate billing information for operating room use. Users define the costs related to surgical cases including: • Procedure • Equipment use • Operating room time • Clinician rates • Anesthesia or other drugs administered during surgery. Other billing features include the ability to have preference card data automatically sent to the billing system and flat-rate charging capabilities.
235.			7. Inventory Control	In order to assist operating room personnel in managing their inventories, the application: • Generates pick lists based upon what was specified at the time the appointment was booked, and what is specified on the preference cards • Prints pick lists by room(s), date(s), surgeon(s), specialty, or patient(s) and sorts by

Line #	Component	Overview	Function	Description
				inventory, inventory location, or materials management location • Provides flexibility within the pick list routines so that hospitals print pick lists using the criteria that best matches the inventory set-up • Supports "Just-In-Time" inventory • Prints pick lists in Central Supply or Materials Management, allowing for greater communication among departments • Offers the ability to combine preference cards for patients having multiple surgeries, thereby avoiding the issuance of duplicate items and costs. Operating Room Management runs under Microsoft Windows NT® format on an Intel® based server and is available to customers running the Client/Server Release of MEDITECH's Health Care Information System (HCIS). Operating Room Management is also available to customers running the MAGIC Release of MEDITECH's HCIS and integrates tightly with MEDITECH's MAGIC software applications.
236.			8. Client/Server HCIS	Health care organizations running the Client/Server Release of MEDITECH's HCIS realize additional functionality by integrating Operating Room Management with the following applications: • Enterprise Medical Record: sets up unverified orders • Supply Chain Management: creates on-line requisitions to manufacturers • Health Information Management: identifies patient and resource conflicts, creates an account in the Registration system, and updates patient's visit history with operating room visit information. The application also offers integration with MEDITECH's General Accounting product.
237.			9. MAGIC HCIS	Health care organizations running the MAGIC Release of MEDITECH's HCIS realize additional functionality by integrating Operating Room Management with the following applications: • Health Information Management: creates account in Registration application, which is accessed by Operating Room Management, identifies patient conflicts, and updates patient's visit history with operating room visit information • Revenue Cycle: processes charges for staff time, procedures, operating times, supplies, and equipment • Enterprise Medical Record: displays surgical profile information from Operating Room Management.
238.	General Accounting	A complete set of financial management software helps to ensure the operational efficiency and accountability of the organization. MEDITECH's software enables executives and managers to track trends and shifts in clinical, financial,	1. General Ledger	The General Ledger functionality in MEDITECH's General Accounting product produces timely and useful financial reports for multiple and single facility health care organizations while conforming to generally accepted accounting principles. The functionality provides controlled and accurate bookkeeping and assists the Accounting Department with powerful and flexible reporting functions. General Ledger is the core of MEDITECH's financial applications, sharing information

Line #	Component	Overview	Function	Description
		and demographic activity. Ease of use, industry-standard access tools, and custom report features make these applications invaluable at all management levels.		seamlessly with MEDITECH's Revenue Cycle and Supply Chain Management products and the Accounts Payable, Fixed Assets, Payroll/Personnel, and Order Entry functionality.
239.				**Chart of Accounts and Organizational Hierarchy** The functionality utilizes a chart of accounts designed to accommodate a hospital environment and support multi-entity integrated health care networks. The functionality facilitates the process of building the chart of accounts by providing flexible methods of structuring the hierarchy and assigning account numbers. These methods include: • User-defined and user-controlled chart of accounts • Unlimited number of defined accounts • The flexibility to handle user-defined account number lengths • The flexibility to create an organization's hierarchical structure, which results in easily obtained Responsibility Management Reports • The flexibility to define an unlimited number of summary reporting paths for report writing and inquiry purposes • Support of control and subsidiary accounts • Support of alphanumeric accounts • Combined data entry and list functions for easy maintenance and viewing of data • Recurring batches for statistics.
240.				**Bookkeeping** A set of bookkeeping functions controls and reports the entry of all transactions into the General Ledger functionality. These features include: • Automatic transfer of transactions from other financial applications • Automatic creation of intercompany transfer transactions • Recording of transactions in on-line batches for easy control and auditing • User-controlled sequence of posting, reporting, and closing • Immediate error checking of all data as it is posted, so the ledger is always in balance • On-line review and edit of batch data before posting to accounts • Free text descriptions of each transaction group • Batch lists available in order entry or in account number sequence • Master Log report that displays all batch transactions for one or more days • Summary batch posting • Reversal of previous batch • Recurring batch capabilities • No limit to the length of time that detail and summary data are retained • Prior and future period transactions • The simultaneous maintenance of multiple open periods • User control of number of transactions per batch

Line #	Component	Overview	Function	Description
				• Real-time update of account balances upon posting • Closing routines process money and statistics accounts.
241.				**Real-Time Inquiry** A powerful inquiry function allows an authorized user to view up-to-the-minute account balances or activity on demand. These inquiries provide an audit trail indicating the transaction sources. On-line account inquiries are displayed in detail, summary, period comparison, or budget comparison Users can select accounts for inquiry by specifying an account number, a range of numbers, or by specifying component values such as salaries and wages for the laboratory or manager's area of responsibility.
242.				**General Reporting** The functionality provides a group of standard reports, as well as financial statements and management reports. General reporting features include: • Reports for multi-corporate systems: – for a single corporation or across corporations – for component or summary values across corporations. • Reports contain details on: – individual account budget, or statistical data – previous, current, and projected data – data from other reports, such as a transfer of net profit or loss from the operating statement to balance sheet – calculations using spreadsheet capabilities – free text comments. • Reports include: – Condensed External Balance Sheet – Detailed Internal Balance Sheet – Comparative Balance Sheet – Operating statements at all reporting levels (in the appropriate formats) – Projected Operating Statements – Statistical Reports – Responsibility Reports – Profitability Reports – Preliminary (trial period still open) and Final (period closed) Reports – Summary Trial Balance – Detail Trial Balance – Subsidiary Summary Trial Balance – Subsidiary Detail Trial Balance – Department Expense Detail Report.
243.				**Budgeting** The functionality's budgeting features allow managers to establish, maintain, and

Line #	Component	Overview	Function	Description
				manipulate budgets with both flexibility and precision. These features: • Support unlimited budget files for current or future periods • Allow for department-level access for budget development and analysis • Allow users to create budget data for accounts from current or previous budget or actual balances • Support seamless integration of budget files created in Payroll/Personnel, Fixed Assets, and Budgeting and Forecasting functionality • Support budget worksheet comparison for a range of periods, including prior fiscal year, actual and projections, and budget variances.
244.				**Allocation** The functionality's allocation functions allow users to define the rules and methods by which expenses and revenues are allocated. These features include: • User-defined allocation methods, including Simultaneous Equation and Step Down • Allocation based on account statistics, money, or manual weighting • Automatically-generated General Ledger batches from allocation tables for both actual and budget data.
245.				**Security Features** The functionality provides a number of security checks which monitor, track, and manage system use, such as: • All system users throughout the health care network are required to have a user-defined password • Audit trail reports link various system activities to specific user passwords • Password-based security checks, which are organization-defined, are located at several entry points throughout the system • Only those users with special organization-defined passwords may access specific department, entity, or corporate information and have the ability to perform certain system functions and routines.
246.				**Access and Option Sets** Users have a preset group of routines or process menus that offer user-defined functioning on one screen. Option sets are available for allocations, money batches, and statistic batches.
247.			2. Budgeting and Forecasting	The Budgeting and Forecasting functionality in MEDITECH's General Accounting application offers health care organization executives, facility administrators, and department managers a powerful tool to create and manage their budgets. Executives, facility administrators, and department managers benefit from these capabilities.
248.				**Worksheets** Each department's budget is created by the appropriate budget planner using on-line worksheets. Budget fields are identical in every worksheet regardless of department or facility, ensuring that each department's budget is generated through a consistent methodology. A budget administrator can issue constraints (such as financial limitations) on each department's worksheet.

Line #	Component	Overview	Function	Description
249.				**“What If” Analysis** The Budgeting and Forecasting functionality projects future budgetary considerations or scenarios with its "what if" analysis feature. A budget planner can enter numbers based on various criteria, experimenting with different budget numbers until the most desirable distribution is created. Several versions of any budget plan can be created in order to project or forecast budgets or specific variables within a budget. A budget administrator can likewise utilize the application's "what if" analysis capabilities to experiment with the numbers in the master budget model or adjust transdepartmental variables, such as the inflation rate, in order to view the impact on the overall budget.
250.				**On-Line Notes** Budget planners can enter on-line notes in the form of free text to explain budget numbers. Notes can be written for each number or for only those that warrant explanations. Likewise, a budget administrator can write on-line notes explaining why the department's budget was approved or altered.
251.				**Setting Or Changing Variable** A budget administrator sets the approved rates for the variables in the master budget and each budget planners' worksheet. When reviewing the department budgets submitted to the master budget, the administrator can change a variable's rate either to see its effect on the rest of the budget numbers or simply to update the variable (i.e., inflation rate).
252.				**Access In and Out of the Network** Due to its integration with the MEDITECH HCIS, the Budgeting and Forecasting functionality can be accessed by planners and administrators with the proper password authorization through a workstation located in: • Their facilities • Any facility in their health care network • An off-site location -- such as a physician’s office or home office -- using a modem.
253.				**Organization-Wide Budget on a Single Screen** The information from each department's worksheet is uploaded into the master budget model. Budget administrators can then view on a single screen: • Totals for the entire organization (including multi-facility organizations) • Grand totals for all departments • Totals by selected department(s) only • Budget numbers for each facility in the organization • Totals in specific categories for all departments, such as total pay increases • The drilled-down numbers that constitute the detail of a specific department's budget plan • On-line notes explaining budget numbers.
254.				**Overriding Departmental Budgets** An override/edit feature allows budget administrators to adjust each department's

Line #	Component	Overview	Function	Description
				budget. To manually adjust a number, the budget administrator simply enters a new number into the cell. The new number appears underlined to show that it was manually entered by a user and not factored and entered by the system. Any changes to variables, such as changing the inflation rate, will not affect the new number. All numbers in the budget affected by the new (or manually entered) number are automatically recalculated to reflect that change. The overridden number can be recalled with the touch of a key.
255.				**Security Measures** The functionality provides a number of security features: • Password-based security checks appear at several levels in the system • Audit trails record all changes made to the data, identifying the time the change occurred and the individual making the change • Audit reports track access to models (time/date and terminal location).
256.				**Excellent Uses In Addition To Budgeting** With its access to data from throughout the HCIS, the Budgeting and Forecasting functionality is also very helpful for planning purposes in many other areas of the health care organization. Users may find its features useful in: • General Ledger Expense Projections • Projected Number of Employees • Projected Salaries of Employees • Projected Patient Days • Admissions Projections • Revenue Projections • Managed Care (Third-Party) Contract Analysis and Negotiation • Service Volume Projections • Reimbursement Projections.
257.			3. Executive Support System	The Executive Support System functionality in MEDITECH's General Accounting product offers hospital executives and department managers from both multiple and single facility health care organizations a powerful management tool to gather and analyze information from throughout their health care networks. It produces user-defined reports instantaneously, enabling decision makers at all levels to view integrated financial, clinical, and statistical information from all departments, facilities, and corporations.
258.				**Network-Wide Information** The Executive Support System collects and displays financial and statistical information residing in MEDITECH's Health Care Information System (HCIS). Screen displays or printouts may include information from a single department or present information from multiple departments throughout the health care organization.
259.				**Financial, Administrative, Clinical, and Patient Care Information** The information contained in the Executive Support System is updated automatically, and functions within the Executive Support System searches the HCIS to gather new statistical information that may have been entered. The Executive Support System

Line #	Component	Overview	Function	Description
				gathers and assembles information from the following applications: • Health Information Management • Patient Care and Patient Safety • Enterprise Medical Record (Order Entry functionality) • Pharmacy • Laboratory and Microbiology • Revenue Cycle • General Accounting • Supply Chain Management • Medical and Practice Management.
260.				**Historical Information** Administrative, financial, and patient care information from the last two years is automatically retrieved and loaded into the Executive Support System functionality at the time of installation.
261.				**Supplemental Information** Information not already resident on the MEDITECH system may be entered and compared with existing data to assist in budgeting and other decision-making analyses.
262.				**Available to All Levels of Personnel** Facility administrators, department managers, and supervisors can view and access information specific to their locations or departments. For example, managers in patient care departments can, with the proper security, view general ledger, materials management, and payroll information for their departments without waiting for printed reports. In addition, managers of departments such as billing, payroll, laboratory, and purchasing can use the Executive Support System to obtain financial and statistical data to assist in running their departments.
263.				**Standard View Fields and "Views"** The Executive Support System is installed with extensive lists of data fields for executives and managers. These standard fields represent data elements from the departmental applications frequently requested by executives, managers, and administrators. Standard views and reports are also available in each application from which the Executive Support System gathers and assembles data. Some applications have two standard views, since data is captured on a daily and a periodic basis (such as Admission Daily and Admission Period).
264.				**Standard and Individualized Reports** The Executive Support System lists data fields from MEDITECH's HCIS in a "view" format. Users can, based upon their security clearance, access both standard and individualized reports.
265.				**Individualized "Views"** Executives and managers have several options available for creating their own

Line #	Component	Overview	Function	Description
				customized views: • User-defined fields • Calculated fields • Reporting of external data • Utilizing standard fields.
266.				**Effortless, Yet Powerful, Report Generator** The Executive Support System makes accessing and viewing information practically effortless. Users simply identify the categories of information they want on a particular view. The Executive Support System automatically displays the data in tabular and graphic formats. Once in the view, the user has several options for changing the display of data or the breakdown of data.
267.				**Flexible Data Analysis** The Executive Support System includes a number of features, which enable users to gather and analyze information at various summary levels and in different time periods. Depending upon the specific application, data is captured on either a daily or period basis. Users have the option of changing the time scale on a view to quarterly, fiscal year, fiscal YTD, or a range.
268.				**Drill-Down Capability** Executives and managers view increasingly specific information by drilling down through multiple levels of detail. Point-and- select operation and windows of choices instantly move users to additional detail, saving valuable time and effort.
269.				**History Option** View information is displayed in the time scale currently associated with the view. Additionally, the net change and percent change in data values over the time period are calculated and displayed in tabular and graphic form to clarify trends.
270.				**Breakdown Option** Detail about selected information is displayed. For example, the number of admissions may be broken down by physician, location, or service. Users drill down to detail based on how the data is stored in the feeder applications.
271.				**Time Slice Option** Information from one time period is compared to prior data in another time period. Additionally, the net change and percent change in data values between the two columns are calculated and displayed for all the data fields on the view.
272.				**Selection Option** Viewed data can be temporarily or permanently limited. This is particularly useful to decision-makers who need or want to only view information from certain areas of the organization.
273.				**Data Display Options** The Executive Support System offers the user several options for data display: • Ascending order • Descending order

Line #	Component	Overview	Function	Description
				• Value • Net change • Name • Percent change.
274.				**Security Measures** The Executive Support System provides a number of security checks to verify, restrict, and track users and to protect sensitive information, such as: • Password-based security checks appear at several levels in the system • Audit trail reports link each Executive Support System activity to a specific user password • "View only" access protects against accidental altering or deletion of information • Performance reports automatically detail compilation, usage, and computer memory storage of the system for MIS personnel • Users are assigned to dictionaries so they can create • customized views and give access to proper users • Users may be restricted to specific data fields.
275.			4. Fixed Assets	The Fixed Assets functionality in MEDITECH's General Accounting product helps both multiple and single facility health care organizations to control and depreciate their assets. The functionality accommodates an unlimited number of assets, such as buildings, land, and equipment. The functionality adheres to either standard or organization-defined methods of depreciation.
276.				**Asset Management** The Fixed Assets functionality monitors and controls assets in four statuses: initial, active, retired, and proposed. Active and/or proposed assets may be incorporated into the budget, with budget projections automatically forwarded to the General Ledger functionality. Fixed Assets allows users to: • Initialize assets for purchasing via links from the Supply Chain Management and General Accounting applications • Maintain organization-defined categories of assets to enhance reporting and inquiry capabilities • Update costs of assets to reflect capital improvement • Track an unlimited number of comments to document changes made to an asset during its lifetime. Users determine specific information on each asset, including: • I.D. number • Description • Class • Typical and useful life • Department • General Ledger asset account

Line #	Component	Overview	Function	Description
				• General Ledger accumulated depreciation account • Amounts for all values stored for each asset • Property number and location • Purchase Order number • Vendor, invoice, manufacturer, and manufacturer's serial number.
277.				**Depreciation Analysis** The functionality manages and computes the depreciation of an organization's fixed assets by providing the flexibility to change the depreciation method, rate, and departmental breakdown during the life of an asset. The system supports: • The ability to track multiple depreciation values for an asset • Standard methods of depreciation, which include: – Straight Line – Double Declining Balances: 200%, 150%, and 125% – Sum of the Years' Digits. • Sample posting, allowing users to view General Ledger posting and the effect on depreciation before the posting actually takes place • Depreciation expenses charged to department or departments based on a specified percentage • The ability to create user-defined depreciation tables, such as ACRS • Proration based upon the month or half year convention (in the fiscal year) • The capability to determine, upon implementation, depreciation from a user-specified month • Prospective depreciation reporting for any future month or year • Retirement of assets, including retire type (discarded, theft) and date.
278.				**Budgeting** The functionality allows for budgeting analysis, creates a schedule projection by General Ledger account, and transfers budget to General Ledger Budget File.
279.				**Flexible Reporting** The functionality includes a series of standard reports, which can be printed on-demand by number, class, department, or any future month or fiscal year. Reports include: • List of Assets • Current Status • Schedule Projections • Activity Summary • Activity Comparison • Activity Detail • Schedule History • Standard Value • Current Value

Line #	Component	Overview	Function	Description
				• Period End Summary • Department Changes • Asset Number Changes. The functionality also features compiled reports, which enable users to create reports that best meet the organization's needs; for example, a report that lists assets with specific manufacturers, sorted by asset number.
280.				**Security/Permissions** Users have a preset group of routines or menus, which authorize access to various processes.
281.				**Standard Dictionaries** Users have the option of selecting asset types for a standard dictionary, which includes assets' useful life information from the American Hospital Association guide.
282.	Supply Chain Management	The organization can combine bar code scanning with MEDITECH's software to automate the inventory process from the point-of-delivery to the point-of-care. The Supply Chain Management product includes full Materials Management and Accounts Payable functionality, along with a Materials Management conversion, an Accounts Payable conversion, a Dispensing System interface, and an EDI interface.	1. Materials Management	The Materials Management functionality in MEDITECH's Supply Chain Management product helps control and manage inventory, supplies, and equipment throughout a multiple or single facility health care organization. The functionality facilitates the purchasing and receiving of supplies and equipment, assists in the analyzing of supplies' usage, manages equipment maintenance, and maintains contract information.
283.				**Supply Procurement** The functionality provides workflow efficiencies and includes features for maintaining purchase orders (POs) and recording shipments received against the purchase orders. For example: • Comprehensive PO information that includes details on: – purchase order number – vendor name, contacts, and terms – order dates – shipping agency – expected delivery dates – shipping point – delivery address – free text comments – line items. • Hospital-defined PO formats • Multifacility environments with POs accommodating different ship-to and remit-to address details • Capability to include inventoried and non-inventoried items on the same PO to facilitate on-line receiving • Capability to combine identical items for different inventories and departments on a single order • Automatic generation of purchase orders for items at or below their minimum

Line #	Component	Overview	Function	Description
				reorder points and non-stock items ordered via department purchase requisitions • Capability to generate standing and blanket POs at user-defined intervals • Receiving documents to record receipts • Capability to handle blind receiving, receiving by exception, or item-by-item receiving • Automatic update of quantity on hand upon posting receipts of inventoried items • On-line inquiry of any PO in either summary or detail format • Single inquiry viewing of receipt and PO information • Worklist routine for processing POs not verified and receipt/invoice discrepancies • On-line invoice reconciliation of POs and Accounts Payable invoices • Purchasing facilities can be defined individually, and users can enter specific purchasing facilities when entering a PO • Ability to enter a trade-in on a PO.
284.				**Purchase Requisition** The functionality maintains purchase requisitions for both inventoried and non-inventoried items, enabling users to process and track all requisitions. The system is geared to handle: • Distributed departmental requisitioning with automatic PO generation from approved requisitions • On-line inquiry of the current receipt status for any purchase requisition • Requisition Activity Report that displays the relationship between acquisition line items and PO line items (including receipt status) • Requisition Lists provided in summary and detail formats by number or department.
285.				**Electronic Procurement** MEDITECH's Materials Management functionality includes a full set of features to automate the supply chain process so organizations achieve quicker deliveries and lower their costs, such as: • Real-time updates to the Item Master files with pricing and catalog information to ensure accurate order information. This results in time savings when researching invoice price discrepancies (832 Price Catalog Update) • Electronic transmission of purchase orders helps reduce delivery time and labor, and ensures data integrity (850 Send Purchase Order) • Supplier acknowledgements validate vendor receipt of purchase order information and can confirm order prices (855 Purchase Order Acknowledgement) • The Advanced Shipping Notice will inform sites of delivery intentions as well as automate the receipt process (856 Advanced Shipping Notice) • Receipt of an invoice file automates the invoice entry process by matching the invoice with the purchase order in an integrated Materials Management and Accounts Payable environment (810 Invoice Acknowledgement) • Electronic funds transfer of vendor payments automates the payment process (820

Line #	Component	Overview	Function	Description
				Electronic Funds Transfer, NACHA format available as well) • A complete set of reporting tools enables users to review transactions sent and received. Purchasing departments can send standard protocol transaction sets using the Internet (FTP), traditional phone lines, and other third-party software packages.
286.				**Inventory Control** A series of inventory control features supply a record of inventory activity – such as issues, returns, adjustments, transfers and purchase order history – and provide both report and inquiry capabilities to help users monitor current stock levels. The system, supporting an unlimited number of inventories, accommodates: • Worklist for inventory requisitions that have not been finalized • Multiple inventory requisition methods: – on-line department requisitions – replenishments for par level inventories – surgical case carts with patient charging capabilities. • Unlimited inventories including off-site warehouses, floor stocks, par levels, and exchange carts • Tracking of transfers from bulk storage • Identification of inventoried items by their item numbers, stock numbers, descriptions, colloquial names, or partial names • Inventory valuation using either Average Cost (AVG), First In/First Out (FIFO), or Last In/First Out (LIFO) method • On-line inquiries that display information on receipts, issues, returns, adjustments, transfers, purchase order histories, or current inventory breakdowns • Capability to record issues and returns of inventoried items for both patients and hospital departments • Automatic calculation of Economic Order Quantities (EOQs), minimum reorder points, and safety stock levels • Automatic update of the quantities on hand • Communication of patient issues and charges to MEDITECH's Revenue Cycle product • Integration with the General Accounting application for departmental expensing and inventory valuation • Identification and management of critical inventory items • Different vendors with various General Ledger account numbers can be specific to each purchasing facility • Facilities can control inventory/purchasing as well as receiving of supplies and equipment to analyze supplies' usage, to manage equipment maintenance, and to maintain outside contract service information • Audit trail for the Item Dictionary Asset tag/serial numbers for all purchase order types.

Line #	Component	Overview	Function	Description
287.				**Bar Code Capabilities** The functionality is equipped with bar code reading capabilities. Handheld terminals, or terminal-attached bar code readers, retrieve data to be transmitted to the Supply Chain Management application for processing. Users generate and read bar code labels when taking inventory and charging items against patient accounts.
288.				**Management and Statistical Reports** The functionality includes a number of management and statistical reports that can be generated on demand, such as: • Purchasing and receiving reports • Inventory control reports.
289.				**Equipment Management** The functionality contains multiple routines, which monitor and manage equipment at the hospital. Features include: • Tracks usage, repair, and preventative maintenance activity • Maintains maintenance contract information on-line • Lists scheduled maintenance during user-specified time periods • Displays complete information, through on-line inquiry, about any piece of equipment • Generates ad hoc equipment and maintenance reports • Notification of work orders needing to be processed for easy handling.
290.			2. Accounts Payable	The Accounts Payable functionality in MEDITECH's Supply Chain Management product provides users in a multiple or single facility health care organization immediate access to complete vendor, invoice, and transaction information. The application helps users: • Maintain proper control over check-generating and bookkeeping practices • Improve the organization's cash flow and credit position • Increase the rate at which the health care organization takes advantage of discounts • Override standard processing of any invoice when necessary. The application also features automatic generation and reversal of accrual batches for inventory items received but not yet invoiced.
291.				**On-Line Transaction Activity** The application facilitates a user's entering and auditing of transactions, while automatically recording transactions in on-line batches. The application features: • Free text descriptions of transactions • A Direct Entry feature that allows immediate posting of individual transactions while maintaining audit trails • User-defined codes and passwords that limit access to authorized personnel • Immediate error-checking of all data as it is entered

Line #	Component	Overview	Function	Description
				• On-line review and editing of invoice and expense distribution data before posting • User-defined batch control totals that can be used to verify batch amounts • A Daily Master Log, sorted by vendor name • Complete integration with the Revenue Cycle and General Accounting applications • Database access to all facilities defined within the MIS • Ability to distribute invoice dollars to multiple facilities • A routine to charge prepaid expenses into future periods.
292.				**Direct Inquiry** On-line inquiry features provide users immediate, real-time, on-demand access to the latest financial information. These inquiries, in turn, provide an audit trail to the appropriate source batches. Inquiry routines detail: • Up-to-the-minute displays of: – all invoice statuses on file for a vendor – detailed transaction histories for invoices, including users' comments – expense distribution for invoices. • Vendor identification by partial name, mnemonic, or vendor number • Invoice identification by invoice number, or a review of the invoices on file for a vendor • Chart of accounts, format/content of reports, etc. • Tracking of invoices, maintaining separate payment schedules and cash accounts, and analyzing cash requirements by each facility.
293.				**Invoice Processing** The application handles a variety of vendor documents, including single-payment invoices, recurring invoices that require a series of payments, and credit memos. The application safeguards against duplicate entry and payment of invoices. Other features include: • On-line invoice matching process which provides real-time access to receiving and purchasing information • A provision to override a vendor's standard terms • The ability to hold, or release for payment, either individual invoices or the entire collection of invoices for a vendor • An automatic hold on invoices for amounts greater than the amount specified for a vendor • Partial payment of invoices • A safeguard against duplicate entry or payment of invoices • Free text comments on invoice transaction histories • Archival storage of historical invoice and transaction data • Separate bank accounts that can track the invoicing and payments for each facility • Ability to cancel only individual invoice when check is voided.
294.				**Invoice Exception** The application streamlines the workflow and communication process for handling

Line #	Component	Overview	Function	Description
				invoice/receipt discrepancies by: • Allowing comments to be attached to invoices • Providing the ability to review and correct invoice/receipt discrepancies on-line • Having PO and invoice inquiries to help reconcile discrepancies • Display history of all transactions associated with the invoice discrepancy.
295.				**Vendor Management** Users have the ability to alter vendor arrangements to accommodate changes. The system can: • Support both one-time and permanent vendors • Provide flexible vendor discount specifications • Separate address/remit to addresses • Handle payment of vendors from different bank accounts • Override vendor addresses or discounts for individual invoices • Share a common vendor file with the Materials Management functionality and General Accounting product • Access vendor history by vendor name, vendor mnemonic, or vendor number.
296.				**On-Line Check Management** Users throughout the organization perform all aspects of their check management directly on-line. The functionality: • Offers demand and manual check capabilities • Supports payment of multiple invoices with a single check • Supports separate check number sequences for each bank defined in the system • Maintains records of manually-generated checks • Allows review and edit of checks prior to printing • Performs check reconciliations, replacements, voids, and inquiries • Allows checks to be marked as unclaimed, and subsequently reinstated • Prints check register by number, date, or activity date, with or without remittance advice or GL distribution • Reconciles checks manually or by file uploads • Check Registers – Outstanding Check List – Unclaimed Check List • Generates patient and insurance refund checks using data and routines shared with the Revenue Cycle product • Shows clear date of check on summary and detail look-up.
297.				**Management Reports** A series of user-defined reports enable managers to monitor and control their accounts payable activities. Users specify the level of detail to be included on these reports each time the reports are printed. • Aged Payables Report

Line #	Component	Overview	Function	Description
				• Cash Requirements Report • Control Report • Period-End Open Invoices Report • Vendor History • Vendor Balances Reports • Federal 1099 Forms and Report • Batch Status Report • GL Distribution Reports • GL Period Activity Reports.
298.				**Security** Health care organizations can: • Segregate duties (invoice entering and posting, for example) by workstation, location, or user • Restrict a user's access to certain menus and routines.
299.	Human Resource Planning	MEDITECH's Human Resource Planning software aids executives and employees in the areas of staff planning and recruitment, compensation, staff development, employee relations, benefits administration, and reporting. Designed to allow for automated and integrated workflow, Human Resource Planning provides Web-based processing and servicing capabilities and allows for timely and efficient information flow to executives.	1. Payroll	The Payroll functionality in MEDITECH's Human Resources Planning product is designed specifically for the complex needs of health care enterprises. The functionality supports an unlimited number of payrolls, benefit plans, job classifications, withholdings/deductions, and employee types throughout a delivery system. The functionality features comprehensive reports and seamless integration with the General Accounting and Data Repository applications.
300.				**Administration of Payroll** The functionality streamlines the administration of payroll for health care organizations. System features include: • Secure access levels for editing or viewing only • Administration of flexible spending accounts • Mass Edit capabilities for base rates, withholdings, benefit plans, and receivable balances • Year-to-date Inquiry routine provides real-time inquiry on an employees' compensation history • Customer-defined queries to store hospital-defined information • Integration with Accounts Payable functionality for third party payments • Direct Deposit • Checking • Budgeting features • Time and Attendance interface.
301.				**Payroll Computation** The functionality accommodates processing of multiple payrolls. System features include: • Flexible timecard capture • Retroactive calculations

Line #	Component	Overview	Function	Description
				• Automatic accrual calculations and reversals.
302.				**Payroll Reports** Reports include: • Out-of-Step Report • Compensation statements • EEO Reports • QTD and YTD Registers • Earnings reports identifying current period, month-to- date, quarter-to-date, calendar year-to-date, and fiscal year-to-date • Monitrend Report • Position Control Report by department and/or job code • Scheduled Evaluations Report and Scheduled Reviews Report • Contract Seniority Report • Base Rate and Rate Change Reports • Audit Trail Reports • Turnover Analysis • 941 Report • Base Rate Report • Benefit Status • Labor Comparison Reports.
303.			2. Human Resources	The Human Resources functionality aids hospital executives and employees in the areas of staff planning and recruitment, compensation, staff development, employee relations, benefits administration, and reporting. The product allows for automated and integrated workflow. It provides Web-based processing and servicing capabilities and includes event-driven triggers. Report scheduling, within HR, also allows for timely and efficient information flow to executives.
304.				**Web-enabled Access to a Full Range of HR Functions** The Human Resources functionality takes full advantage of the power of the Internet through: • eRecruiting via on-line job posting and application submission • An employee self-service portal for updating and viewing demographics, benefits, and enrolling in training classes • Integration with your hospital's existing Web site.
305.				**Comprehensive Tools to Streamline Workflow** A variety of tools helps streamline workflow, including role-based desktops for organizing and managing workloads. Flexible event-driven triggers help manage crucial events, dates, expirations, and more. Other tools to increase efficiency include: • Facility-defined tasks and checklists • Process screens for quick and easy navigation

Line #	Component	Overview	Function	Description
				• Electronic personnel action forms • Organizational chart to establish a chain of command for reporting and routing.
306.				**Centralized Recruit-to-Retire Employee Files** Organizations have a comprehensive, centralized record of vital information collected throughout an employee's career. Information that can be tracked and captured will include: • Comprehensive demographics • Payroll data • Health and safety records • Training records • Pictures and badges.
307.				**Audit Trails for Security** Audit trail reports are available to chart a history of changes made to employee information, indicating the user, date, and time stamp of the change and the previous value(s).
308.				Comprehensive Reporting Capabilities Comprehensive, standard reports allow managers and HR staff to monitor and analyze a wide scope of data. Reports include: • Out-of-Step Report • EEO Reports • QTD and YTD Registers • Position Control Report by department and/or job code • Scheduled Evaluations Report and Scheduled Reviews Report • List of Employees by Contract Group • Contract Seniority Report • Status Change Report • Audit Trail Reports • Turnover Analysis • 941 Report • Employee Reports Year-to-Date Inquiry • FSA Activity Statement • Benefit Status • Labor Comparison Reports.
309.			3. Staffing and Scheduling	The Staffing and Scheduling functionality included in MEDITECH's Human Resource Planning application enables managers and heads of all groups and departments in multiple and single facility health care organizations to create detailed, accurate, on-line work schedules for their staffs. The software provides all information necessary to simplify staffing and scheduling, trimming considerable time and effort from the schedule making process. Authorized schedule makers can experiment with draft schedules on-line before creating a final schedule.

Line #	Component	Overview	Function	Description
310.				**Scheduling for All Staff** The functionality allows all the health care organization's employees to be scheduled on-line. For example, nurses, technicians, transcriptionists, administrators, maintenance, and volunteer staff can be scheduled through the system.
311.				**Scheduling Criteria Set By Groups and Departments** Groups and departments easily set up their own templates to create staff schedules. Templates allow diverse groups with varying needs to set their own scheduling criteria. Authorized users can always change their groups' staff scheduling template as needed.
312.				**Staff Skills Feature** The specialized skills of individual staff members are viewable on-line in the functionality. Special skills (e.g., a radiology technician who is trained in nuclear medicine; a nurse who is I.V. certified) are entered into the functionality. These special skills then appear on screen when a schedule is being prepared. Managers can also run reports through the Staffing and Scheduling functionality to list all staff whose certifications will expire soon. These managers can then send e-mail messages to their staffs advising them of their certification statuses.
313.				**Sorting of Staff** Schedulers can view information on all their staff on-line. Staff can be organized either by last name or by staff type and last name. By grouping similar staff types, this feature makes it easier for schedulers to find available personnel to work on a particular shift.
314.				**Ideal Staffing Variance** Built-in features ensure that the necessary numbers and types of staff are scheduled to work a shift. A draft schedule informs the scheduler if the shift is overstaffed or understaffed. Patient acuity is also factored into the system for nursing staff. This variance feature enables managers to balance work schedules in order to distribute resources more efficiently.
315.				**Budgeting Information For Cost-Conscious Scheduling** Budgeting capabilities in the functionality help managers evaluate the cost-effectiveness of their proposed schedules. Managers can compare the cost of their proposed schedules to the funds they have in their budgets. To break down an annual staffing budget, managers use helpful budget distribution features. Using budget distribution, managers can allocate dollars to specific time periods. If, for example, a care area experiences higher census and acuity during the summer months, the manager can allocate a higher percentage of the annual budget to these months. Budgets also can be broken down further by staff type.
316.				**Automatic Timecard Generation** The functionality automatically generates timecards for employees who use them. These completed timecard records are sent to MEDITECH's Payroll/Personnel functionality, saving staff, managers, and clinical department heads from maintaining

Line #	Component	Overview	Function	Description
				and processing manual timecards. The timecards support any combination of job codes and shifts. For example, an R.N. works as a charge nurse one night per week; her timecard reflects that she merits a different rate of pay for that night's work.
317.				**Electronic Signature** Timecards can be electronically signed on-line by as many as nine people. The timecards are generated directly from the posted schedule. If an employee is out sick or works an extra day (not on the posted schedule), the authorized manager can either edit the schedule or update the worker's timecard to reflect the change.
318.				**Special Requests** The entire process of asking for, receiving, and scheduling special requests (i.e., days off) is performed on-line through Staffing and Scheduling. These can include requested vacations, planned sick days, or jury duty. After employees enter their requests, the manager can approve or deny the request on-line. An e-mail message is automatically sent back to the employee verifying or denying the request. Approved requests automatically update schedule generation. Likewise, timecards are modified to reflect each person's approved special requests.
319.				**Per Diem Tracking** The system's per diem capability assists managers who schedule employees to fill in for vacationing co-workers. For example, the system keeps record of: • Recent calls to eligible staff (so duplicate calls are not made) • How often a particular employee has accepted or declined an offer to work • Availability of per diems • Pay rates of per diem and on-call staff.
320.				**Volunteer Scheduling** Volunteer workers can be configured into the on-line staff schedule. The functionality treats volunteers like regular staff members, except the system does not link volunteer workers to the payroll software to generate paychecks. When creating a schedule, schedulers can use the system to determine the effect volunteers have on the workload of regular shift workers.
321.				**Flexible Security Levels** The functionality offers different security levels, so care organizations can control and limit access to schedules. Scheduling can be centralized or decentralized for the entire health care organization. Centralized scheduling offers added control, while a decentralized approach (location by location) means schedules can be quickly updated with call-ins, switches, etc. Other access options include: • Own: employees are allowed to self-schedule at their own locations. They can view (but not edit) other employees' schedules. • Location: employees can edit all schedules for the locations to which they are given access. • All: users can edit schedules for all employees on all locations.

Line #	Component	Overview	Function	Description
				• None: employees are not allowed to enter any information to schedules.
322.				**Optional Features** The functionality can share information with many other applications: • Patient Care and Patient Safety: Patient acuity information is available to authorized Staffing and Scheduling users. This enables schedulers to determine the degree of care needed for a specific shift • General Accounting: Budgeting information from this product is shared with the Staffing and Scheduling functionality. This enables schedulers to determine if proposed schedules are economically feasible.
323.			4. Internet Access	MEDITECH's Internet Access functionality enables health care organization employees to easily access work-related data in order to manage daily tasks efficiently. In addition to general employee features, the application also provides specific tools for administrators and front desk personnel. MEDITECH ensures that data in the Internet Access functionality is secure and encrypted when transmitted across the World Wide Web.
324.				**Administrators have the ability to:** • View daily activity and departmental summaries of charges, costs, and revenues • Quickly access registration data, including number of admissions, discharges, bed days, and appointments • View the organization's fiscal status with a financial overview feature.
325.				**General employee features allow staff members to:** • Access their daily work schedules, professional benefits, and personal information • View their earning and withholding information from previous years • Submit vacation requests.
326.				**Front desk personnel have the ability to:** • View the organization's directory, including directions and contact information for all facilities • Access general patient information such as patient location in the health care facility.
327.				**The Internet Access functionality provides features for information systems staff members, enabling them to:** • View daily Web usage summaries that break down the number of system accesses by user type • Monitor a system status log around the clock.
328.	Cost Accounting	MEDITECH's Cost Accounting application helps both multiple and single facility health care organizations monitor and control their costs. The application utilizes information	1. Standard Cost Development	The application helps a health care organization develop standard costs for all services, on a unit level, in the health network. The application includes: • A Service Unit Rules File that contains the user-defined logic which determines the cost of a service unit, which, in many cases, will have a one-to-one correspondence with procedure codes in billing • Ability to utilize micro-costing and allocation methodologies

Line #	Component	Overview	Function	Description
		found throughout the entire Health Care Information System to create detailed reports on comparisons of actual and standard costs, fixed and variable costs, budgets, variance analyses, service profitability, and departmental responsibility.		• An on-line Resource Rates File that stores past, present, and future average rates for micro-costed resources such as labor and materials • Procedure/Service Unit mapping which allows procedure codes to be assigned to multiple service units, and multiple procedures to be grouped to individual service units, to facilitate 80/20 costing methods • A Standard Cost File that contains the total standard cost for each service unit, plus a breakdown by cost group • A categorization of labor, material, and overhead for up to 10 Cost Groups, which can be classified as Direct or Indirect, Fixed or Variable • Cost Group reporting so your organization can analyze both standard and actual costs by groups.
329.			2. Complete Integration with the Entire System	The application is fully integrated with other MEDITECH applications to streamline the flow of information, prevent redundant data entry and duplication of effort, and generate reports that contain the most up-to-date, comprehensive information. Information includes: • Historical data for standard cost development • Service units as they relate to billing and nursing procedures • Revenue and profitability statistics • Spending, volume, and labor variance • Procedure usage • Billing procedures • Productive labor hours and dollars.
330.			3. Profitability Reports	When combined with the Health Information Management application, Cost Accounting provides users with the features and functionality to generate multiple profitability reports based on various selection criteria. Features include: • A detailed Patient Service Unit Report indicates the total standard cost of providing services to a patient and compares this cost to reimbursement activity cost per day; this information is also available through the Patient Cost Per Day Report • Patient Cost Analysis reports provide a comparison of cost, charge, and reimbursement data (in detailed or summarized format) for a group of patients selected
331.			4. Departmental Reporting	The system creates departmental reports, which illustrate standard costs and service usage by department. These reports allow for budget comparison and variance analysis by managers throughout the organization. • Department variance reports contain all costs incurred and related variances at the department level • Department Labor Variance Analysis Report details labor cost by department, cost group, and job code • Flexible Budget Report details, by department, a comparison of cost based on both fixed and variable amounts.
332.			5. Departmental Budgeting	The application provides managers with volume and cost data in order to help prepare budgets.

Line #	Component	Overview	Function	Description
				• Using past data, the system develops profile service unit usage by user-defined product line(s) • By entering expected product line or service unit volumes for an upcoming year, managers can obtain expected volumes of service units and expected standard costs by department and cost group • Budgeting is possible by product line(s) and by service units based on actual volumes for previous periods.
333.	Data Repository	MEDITECH's Data Repository provides health care organizations an open environment for powerful reporting and decision-support tools. The integrity and consistency of the Data Repository database results from the tight integration inherent in the MEDITECH Health Care Information System (HCIS).	1. Industry-Standard Access Tools	The Data Repository employs industry standards such as: • Microsoft Windows NT® operating system • Microsoft SQL Server® Relational Database Management System.
334.			2. Components	The Data Repository is made up of the following components: • The MEDITECH Data Repository application • The MEDITECH Data Repository Manager • A database on Microsoft SQL Server. This database of relational tables offers users the ability to custom design queries using third party software.
335.			3. Reporting Flexibility	Reporting Flexibility • Provides fast, easy generation of reports • Allows for graphical display of data • Provides an open environment and assures organizations of a stable and continually-evolving platform • Supports off-the-shelf, industry standard software tools, like Microsoft Access®, for analysis and presentation of targeted data • Implements consistent naming conventions and foreign key designations. These standard features offer the following benefits: – An environment enabling streamlined report development and updates – An environment providing virtually unlimited opportunities for development efforts using the Data Repository as a foundation. • Tables are defined with clustered indexes, which are based on the primary key constraint on the table. Customers have the flexibility to create additional nonclustered indexes as needed to optimize their unique reporting needs.
336.			4. Accepts Data from Other Vendors and Industries	The Data Repository provides an open environment where data accumulated from the MEDITECH applications can be integrated with information from non-MEDITECH products. The Data Repository can collect, store, and report on information from: • Acute care hospitals • Ambulatory clinics • Physicians' practices • Home health care agencies • Rehabilitation facilities • Skilled nursing facilities • Psychiatric facilities • Hospice centers

Line #	Component	Overview	Function	Description
				• Independent specialty clinics • Insurance companies. Other vendor and industry data can be incorporated into the MEDITECH system in several ways. An organization may employ one or maybe all of the below options: • Standard interface protocols. Validation and referential integrity checks occur when the data is filed in the application, as with any interfaced data, thus ensuring imported information conforms to the care organization's standards and established nomenclature. • By filing the data directly to the Microsoft SQL server the new data and associated tables can be correlated seamlessly with existing data in the MEDITECH system • Customer-defined screens to capture and report on data from other organizations, including insurance companies (for example, admissions insurance queries).
337.			5. Enhances Efficiency of Transactional System	Users can report on information in the Data Repository without impacting the speed of their live environment. Physicians, clinicians, and other staff using the MEDITECH HCIS are not adversely impacted by any analyses taking place in the Data Repository.
338.			6. Access to Health Care Data for Reporting and Decision Support	The Data Repository contains data from the clinical, administrative, and financial applications down to detail level. The Data Repository allows care organizations to: • Simplify report development through the utilization of standard column naming conventions • Study data to conduct business and research analyzes • Quickly analyze the broad scope of information and draw conclusions about patient treatment strategies, strategic planning, and outcomes reporting • Identify cost efficiency levels on an overall organizational basis, and on a provider-by-provider basis.
339.			7. Powerful Reporting Capabilities	The Data Repository collects information on patients throughout an enterprise, organizes it for study, and makes it completely flexible for intensive reporting and analysis. • Data currently available in the MEDITECH HCIS can be initially loaded into the Data Repository, allowing reporting and decision-support benefits to be realized the day the initial loads have completed • Vast storage capacity provides immediate access to comprehensive historical data • Data which is updated in an application is also updated in the Data Repository • Users can create custom tables, using the industry-standard SQL tools • Users may custom-design queries using third-party software to perform unlimited analysis on patient populations • Standard views designed to run under Microsoft Access are provided with the Data Repository. Users may copy these views as a template and make modifications to create their own views. Some areas where views exist include: – Resource Utilization – Indicators

Line #	Component	Overview	Function	Description
				– Cardiovascular – Obstetrics – Financials – Abstracting – Scheduling Performance – Physician Evaluation – Infection Control – Pharmacy Utilization.
340.			8. Flexible Scalability	Users have the option of selecting either the batch mode or the continuous mode of update. • Batch processing of transfers from the MEDITECH applications to the SQL database at user-defined times. The update is typically scheduled when network traffic is low, for example, at two or three o'clock in the morning. • Continuous processing of transfers from the MEDITECH applications to the SQL database. This mode offers the customer the ability to distribute the workload, associated with sending data to the repository, throughout the day.
341.			9. Security	Access to the data within the Data Repository is completely controlled by the security features inherent in Windows NT and the SQL server. This security is very flexible and can restrict user access to specified tables and/or columns in a table. Row level security can also be realized by the use of Views.
342.	Scanning and Archiving	MEDITECH's Scanning and Archiving solution enables health care organizations to move toward a paperless environment by storing all health care information on-line. This application provides customers with an organization-wide solution to their document scanning and imaging needs, enabling staff members to quickly scan documents into their system, review the quality of images, associate documents with patient records, and incorporate the resulting digital documents directly into users' workflow. The Scanning and Archiving application enables customers to generate and maintain complete, secure, legal medical records. Tools are incorporated to efficiently	1. Document Scanning	Users have the ability to scan documents in both portrait and landscape formats, individually or in batches.
343.			2. Image Viewing	An image viewer provides a full page display of images. Users are able to rotate, flip, and zoom in and out of images as well as review the quality of imaging.
344.			3. Archived Data and Image Storage	Organizations have the ability to store data on any device that presents itself to the MEDITECH system as a Microsoft® Windows®-accessible platform storage device.
345.			4. Bar Code Recognition	The application is capable of recognizing bar code labels or codes on pre-printed forms to identify document type and/or patient identification to allow automatic indexing of documents.
346.			5. Improved Revenue Cycle Management	Users have the ability to scan patient information such as drivers' licenses and insurance cards into their information system and to link this information to patient billing records to enhance the revenue cycle. This scanning and indexing of information is incorporated into the registration process to expedite workflow. Some of the information that can be scanned at the point of registration includes legally identified documents, such as surgical consent forms and living wills, in addition to clinically relevant data, including values from outside laboratories.
347.			6. Streamlined Health Information Management Processes	The Scanning and Archiving solution streamlines the release-of-information process within the Health Information Management Department. Requests are honored without the cumbersome tasks of finding and copying documents, and reassembling the charts. The use of scanned documents results in the reduction of storage issues and inherent

Line #	Component	Overview	Function	Description
		organize and manage enterprise-wide documents, resulting in an increase in the quality of patient care and safety, and improved revenue cycle as well as a reduction in the risk of liability due to paper loss.		costs of retrieving paper charts. In addition, chart requests are dramatically reduced with the capability for clinicians to review patients' comprehensive medical histories on-line. Clinicians benefit from immediate access to scanned images in the on-line medical record. Physicians also have the ability to complete all chart deficiencies from any workstation. Scanned images are linked to the incomplete record notifications to alert physicians of any deficiencies. Physicians may simultaneously view and electronically sign documents, which immediately updates deficiencies. This automatic transaction does not require the intervention of a Health Information Management analyst, thus streamlining workflow.
348.			7. Streamlined Coding Workflow and Tools for Monitoring Coder Productivity	The Scanning and Archiving application helps to ensure medical records are comprehensive and complete by the efficient incorporation of images into the workflow. Patients' complete charts are available to coders through MEDITECH's Enterprise Medical Record application while the coders perform their work, enabling on-site or remote coding in a paperless environment. Coders have worklists, based on their user profiles, to navigate through charts while coding. In addition, Health Information Management professionals are able to manage and prioritize patient charts as well as assign workload.
349.			8. Simplified Creation of a Legal Record	Any documents or forms generated in the system via clinical and/or administrative documentation are automatically indexed into the electronic chart in a defined order, which facilitates the easy creation of an electronic record. Additional printing and re-scanning of these forms is not necessary. Using this electronic record, your health care organization ultimately produces a facility-defined legal record.
350.			9. Portable Medical Records on CD	MEDITECH customers are able to easily generate complete legal records on CDs. This subsequently contributes to the ease in reproducing the legal medical record. With the legal record available on CD, patients have a portable medium on which to access their personal health information.
351.			10. Administrative Tools	Reports are provided for users to track the movement of images in the system, and to monitor staff performance.
352.			11. Business Office Scanning	A future Business Office component of the Scanning and Archiving product will incorporate document scanning into the workflow of MEDITECH's financial applications so that organizations can include scanned documents into their financial solutions such as Human Resources, Accounts Payable, and Materials Management.
353.	Long Term Care Clinicals	MEDITECH offers comprehensive financial, administrative, and clinical features to facilitate a full continuum of service for extended care patients and residents. The Long Term Care products are well integrated to maximize the exchange of information	1. Resident Assessment Instrument	Resident Assessment Instrument • Pre-Admission Assessment Qualifier • Point-and-click technology within the MDS for ease of documentation • Sharing of query responses between assessment documentation and the MDS • Ability to recall values from either previous MDSs or PCS assessments • Multiple users able to document within MDS and RAPS simultaneously • Extensive MDS error checking at the section level as well as overall • ICD9 Diagnosis flow between Admissions, Abstracting, and the MDS

Line #	Component	Overview	Function	Description
		between applications. This extensive real-time integration minimizes the time required to enter crucial patient information and eliminates duplication of effort throughout the care continuum. MEDITECH's Long Term Care Clinicals product includes a comprehensive and fully compliant Resident Assessment Instrument (RAI) with many features to assist with the intensive RAI process. The clinical software also streamlines information, from initial ordering and verifying of results to daily resident charting. All data is immediately available within a single automated chart. The system provides flexibility to tailor care providers' access to confidential data, residents, locations, and panel items within the Enterprise Medical Record.		• Medications populate Section U from active medication list • Quality Indicator reporting • A multitude of reporting tools available to assist with managing the MDS schedule • Direct link between MDS responses and problems appearing on the Plan of Care • Ability to manage which residents have been successfully accepted into the state database, by allowing users with the appropriate access to change the overall status of an MDS to Accepted. RAI components will remain editable until deemed Accepted by someone on-site.
354.			2. Patient Assessment Instrument	Patient Assessment Instrument • Inpatient Rehab Facility Patient Assessment Instrument (IRF-PAI) form • Calculated CMGs sent to B/AR
355.			3. Care Planning	Care Planning • Multi-disciplinary Plan of Care Routine that allows for easy navigation and review • Ability to associate a responsible party to interventions • Care providers can establish facility and resident-specific Care Plans or Critical Paths for generation of discipline specific worklists • Suggested problem list triggered via responses on MDS Assessments • Multi-functional routine where one can easily access resident notes, outcome, and intervention documentation • Ability to capture Care Plan review date, time, and user, immediately available on an audit.
356.			4. Clinical Documentation	Clinical Documentation • Patient assignment and identification list • Standard of Care for delivery of protocol or location-specific care • Ability to generate a suggested list of problems from assessments— a list that can be included on the resident's Plan of Care • Care provider-specific worklists of interventions needing to be performed per resident • Ability to establish a Plan of Care for an individual resident; this can be a Care Plan or a Critical Path for the generation of work lists and assignments • Flowsheet style documentation • Point-and-click methodology allows for quick and easy response to assessments • Extensive charging capabilities for treatments and therapies • Ability to record on-line medication administration (MAR) • Monthly Treatment Administration Record (TAR) grid identifies frequency of when documentation needs to occur • Extensive reporting and printing capabilities.
357.			5. Order Entry	Order Entry • Ability to enter an unlimited number of order sets, series orders, and clinical interventions

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				• Ability to enter, amend, cancel, print or verify orders • Ability to view clinical results and reports • Ability to restore orders from one admission to the next within a facility-defined time period • Medical Necessity can be set up per procedure to prompt users for ICD9 code and modifier, if appropriate; the Medicare Advance Beneficiary Notice (ABN) can be printed at time of order entry for resident signature • Ability to record resident administrative and order information for quick and easy on-line reference • Dietary data easily reviewed and updated • Dietary reports detail residents' diet histories, current diets, and restrictive diets • Meal counts, meal labels, and nourishment labels • Sophisticated security features, including audit trails.
358.			6. Enterprise Medical Record	Enterprise Medical Record • Collects, stores, and displays clinical data from all MEDITECH clinical applications, other vendor applications, and outside resources such as hospitals, clinics, and provider offices • All aspects of care are located in a single resident chart and instantly accessible to health care providers, as data can be trended across multiple visits. • Multiple numerical results can be graphically represented in one display, while reference ranges and abnormal result flags help care providers easily identify data that is not within normal limits • Provides access to confidential data, residents and panel items can be tailored to each care provider • Provider Order Management ordering features enable physicians and care providers to enter new orders for residents, view the details of a specific order, view the order history for a resident's current visit, modify or request the cancellation of existing orders, stop/start/hold medication orders, view and enter allergy information, and restore orders from a previous admission.
359.			7. Integration with Hospital system	Integration with Hospital system For enterprises that share functionality between the MEDITECH Acute Care software and the MEDITECH Long Term Care Clinicals product, features include the ability to: • Process LTC ancillary orders, and automatically transmit orders to the acute care facility's Laboratory and Microbiology and Imaging and Therapeutic Services products • Share Height, Weight and Allergy information between Long Term Care and the acute care Enterprise Medical Record systems • View LTC Ancillary results in the Enterprise Medical Record under the Long Term Care account.
360.	Long Term Care Administrative	MEDITECH offers comprehensive financial, administrative, and clinical	1. Admissions	Admissions features include ability to: • Assign visit-specific account numbers and unique medical record numbers upon admission/registration

Line #	Component	Overview	Function	Description
		features to facilitate a full continuum of service for extended care patients and residents. The Long Term Care products are well integrated to maximize the exchange of information between applications. This extensive real-time integration minimizes the time required to enter crucial patient information and eliminates duplication of effort throughout the care continuum. The Long Term Care Administrative product meets all federal, state, and intermediary billing requirements. All resident account information is accessed from one centralized location, maximizing efficiency by providing a streamlined flow of resident demographic information. A series of user-defined reports allow you to view and trend financial and statistical information throughout the health care enterprise.		• Collect and update demographic and insurance information, including changes in insurance coverage • Capture multiple diagnoses upon admission/registration • Quickly retrieve resident demographic information from previous admissions/registrations and update when necessary • Capture Medicare, Medicaid, and dual bed certification, as well as track percent occupancy • Track referrals and inquiries • Bed management with large screen Bed Board • Put beds on reserve • Waitlist a pre-admission or an existing resident for a bed • Assign rooms and beds electronically with error checking • Capture daily care charges • Track level of care changes • Monitor leave of absence/hold days • Track temporary vs. permanent beds • Easily access Census reports, including census with RUGs detail.
361.			2. Revenue Cycle	Revenue Cycle features include ability to: • Access all patient account information through one centralized routine • Enter charges manually through a simple routine, or retrieve them automatically via other MEDITECH applications • Easily enter payments, adjustments, and refunds • Centralize billing and collections while still allowing for different pricing or payer requirements in a multi-facility environment • Produce interim bills, age each interim bill, post payments to each interim bill • Track exhausted benefits, including calculating and updating "days remaining" for full, co-insurance, and lifetime reserve days (if applicable) • Set up system to automatically "rollover" to a new insurance order after resident has exhausted benefits • Pre-bill self-pay patients for room and bed charges, and Medicaid patients for liability amounts • Track Medicare Part B revenue and reimbursement • Allocate revenue to the General Accounting by either primary insurance or Medicare Part B • Electronically submit UB92's and HCFA 1500's • Establish "Master" Contracts to facilitate the setup of reimbursement rules applicable to all residents with a particular insurance, i.e. Medicare, and calculate contractual adjustments at the time of billing • Establish "Patient Specific" contracts to facilitate the setup of reimbursement rules applicable to a single resident and calculate contractual adjustments at the time of billing

Line #	Component	Overview	Function	Description
				• Generate statements on a monthly basis (or any user-defined cycle) that will summarize room and board charges • Transfer billing data daily and monthly to MEDITECH's General Accounting product • Transfer refund data to MEDITECH's General Accounting product.
362.			3. Resident Trust Accounting	Resident Trust Accounting features include ability to: • Record deposits (social security, cash) and withdrawals (barber and beauty) • Track fiduciary data including fiduciary demographics, expenses, assets, and sources of income • Auto batch monthly sources of income such as deposit of social security check, cutting down on manual entry of these transactions • Post interest which will automatically be dispersed across accounts based on residents' average daily balance • Generate statements as well as reports showing account activity in summary or detail formats • Transfer funds from Resident Trust to Resident's Self Pay balance in the Revenue Cycle product (optional).
363.			4. Medical Records	Medical Records features include ability to: • View a complete history of a resident's visits, along with a diagnosis associated with each visit • Store demographics and insurance information for future retrieval • Store a resident's picture so staff can view or print as needed • Perform multiple functions for a list of patients through a single routine including signing out/returning records, processing incomplete records, and tracking correspondence requests.
364.			5. Abstracting	Abstracting features include ability to: • Code on-line using ICD-9 codes, CPT-4 codes, and modifiers • Interface with a number of encoding systems • Electronically submit state abstract tapes • Create organization-defined case mix reports.
365.			6. Integration with Hospital system	For enterprises that share functionality between the MEDITECH Acute Care software and the MEDITECH Long Term Care Administrative product, features include the ability to: • Share demographics stored during prior visits, and link long term care visits with hospital visits all in one file • Automatically create a long term care Pre-Admission upon Hospital discharge, based on discharge disposition • Bill ancillary charges for orders processed at the Hospital from the long term care Revenue Cycle functionality • Transmit LTC Revenue Cycle data to the hospital's General Accounting product • Feed long term care / billing data to the hospital's General Accounting product.

Line #	Component	Overview	Function	Description
366.	Behavioral Health Clinicals	MEDITECH's Behavioral Health Clinicals product helps organizations manage both the quality and cost of care provided to behavioral health clients. This fully-integrated client-focused system provides a continuum of mental health care, ranging from emergency crisis intervention, acute and long-term care hospitalization, short-term episodic outpatient treatment services, and longer-term rehabilitative outpatient mental health services. The system integrates information across administrative, financial, and clinical departments, helping organizations function more effectively. Client information is always accurate and up-to-date, and administrators have immediate access to the clinical and financial statistics they need. Behavioral health agencies are able to work cohesively with acute care hospitals, ambulatory facilities, and home health agencies in their health care network. All providers throughout the organization can access a client's psychiatric and medical condition when care is required. Staff can view all care that a client receives in an on-line medical record. Security and confidentiality features enable organizations to set access parameters to client data for each user within	1. Standard Clinical Features	**Enterprise Medical Record** MEDITECH's Enterprise Medical Record (EMR) functionality includes a single client chart where treatment teams and care providers can view information from a single episode of care or for the entire medical record. Data from MEDITECH applications within the enterprise, as well as from other vendor information systems, is collected and stored in the EMR. Data displays are specific to your organization type, and for those enterprises that support an entire spectrum of care, users can select data displays customized for an acute, behavioral health, and long-term care setting. Other features include customization of patient lists, trending, graphs, confidential access and security, and highlighting of new information since last review.
367.				**Order Entry** MEDITECH's Order Entry functionality provides care providers with fast, accurate entry of orders from a single screen along with immediate access to patient information and test results. The functionality links patient locations to clinical departments in a powerful information network, therefore reducing the time required to identify a patient, and helping providers to enter, edit, or cancel patient orders quickly and with ease. Order Entry simplifies the ordering process through order sets, whereby one entry can create a group of orders for multiple departments. Series orders can be generated with user-defined limits. Caregivers can track the status of orders as well as retrieve clinical data. Reports and statistics can be generated for nursing areas and ancillary departments. An electronic signature feature is also available for organizations that require orders to be signed by an authorized provider. Order Entry is integrated with MEDITECH's Enterprise Medical Record and Patient Care System functionality.
368.				Patient Care System MEDITECH's Patient Care System (PCS) functionality is an electronic documentation system offering care providers interdisciplinary Plans of Care required for a patient-focused care delivery system. Automated worklists allow care providers to document care using a Windows® point-of-care device. PCS display panels provide the ability to observe up-to-date patient information. Dynamic electronic links to MEDITECH's Enterprise Medical Record functionality offer care providers another resource for their clinical decisions. These links support critical data review during the assessments and outcomes documentation process.
369.			2. Standard Care Management Features	MEDITECH's Care Management functionality allows for the comprehensive coordination of a client's care across an entire enterprise. The software provides the care coordinator with functionality for caseload management, enrollments, waitlist management, treatment planning, and assessments. All features are fully integrated with MEDITECH's Health Information Management, Revenue Cycle, Patient Care and Patient Safety, and Enterprise Medical Record applications.
370.				**Client Services Inquiry** MEDITECH's Client Service Inquiry feature allows users to monitor potential Continuing Care clients. It serves as an initial location where users can document referrals and enter incoming calls for required services. As a multi-purpose process screen, it offers the flexibility of entering minimal information on the inquiry or

Line #	Component	Overview	Function	Description
		the organization.		completing a full intake, which begins to process the client into the hospital's health care information system.
371.				**Clinical Eligibility Determination** MEDITECH's Eligibility feature allows for quick and accurate collection of demographic and historical information on potential clients, in order to perform need determinations. The system allows a user to monitor the referral, application, and approval process to facilitate informed decisions on a person's eligibility to receive requested services.
372.				**Service Planning** The Care Management functionality facilitates the documenting of functional assessments, the processing of individual service plans for treatment, and the enrollment into identified programs. Care coordinators can identify program specialties, such as a certain language, to best meet the needs of the client.
373.				**Program Management** Once a client has been enrolled, the Care Management functionality allows program clinicians to track the client's progress via notes and outcomes. All information is readily available via comprehensive inquiry and history displays.
374.				**Waitlist Management** If a program or service is at capacity, the Care Manager's waitlist functions allow you to manage their waitlist process effectively. This functionality enables a user to break down programs by various criteria in order to get an accurate measure of the capacity of a facility. In addition to enhancing the capacities of programs, a worksheet will be created to assist in waitlist management. This worksheet will display user-defined programs and give the waitlist coordinator a snapshot of what is available in multiple facilities. Users can easily view all clients on each of the waitlists. Once space is available in a facility, the Care Manager's waitlist functions quickly enrolls the client into the necessary programs.
375.				**Desktop Workload Management** MEDITECH's Desktop is a tool that care coordinators can use to organize their work. The Desktop feature alerts users to date sensitive events such as eligibility treatment plan reviews, court appearances, and user scheduled events. Additionally, it is integrated with our Risk Management application and provides alerts for critical incidents, which may affect a client's treatment.
376.	Behavioral Health Administrative	MEDITECH's Behavioral Health Administrative product helps organizations manage both the quality and cost of care provided to behavioral health clients. This fully-integrated client-focused system provides a continuum of mental health care, ranging from emergency crisis	1. Registration and Medical Records	Our Registration and Medical Records functionality collects and updates demographic information, family contact data, insurance coverage, diagnostic Axis codes, and leave-of-absence/hold days. The assignment of rooms and beds is handled electronically, eliminating errors. Direct enrollment into outpatient programs and services is available along with corresponding attendance statistics. All ORYX-required data elements are included.
377.			2. Abstracting	MEDITECH's Abstracting functionality collects and reports various patient information, such as Peer Review Organization (PRO) data, as well as data for state and federal reporting requirements. Abstracting features include on-line coding of inpatients and outpatients using ICD-9 and DSM-IV diagnosis codes. Organizations can

Line #	Component	Overview	Function	Description
		intervention, acute and long-term care hospitalization, short-term episodic outpatient treatment services, and longer-term rehabilitative outpatient mental health services. The system integrates information across administrative, financial, and clinical departments, helping organizations function more effectively. Client information is always accurate and up-to-date, and administrators have immediate access to the clinical and financial statistics they need. Behavioral health agencies are able to work cohesively with acute care hospitals, ambulatory facilities, and home health agencies in their health care network. All providers throughout the organization can access a client's psychiatric and medical condition when care is required. Staff can view all care that a client receives in an on-line medical record. Security and confidentiality features enable organizations to set access parameters to client data for each user within the organization.		electronically submit state abstract files as well as performance and outcome measurements (NASMHPD).
378.			3. Revenue Cycle	MEDITECH's Behavioral Health Administrative product efficiently handles all aspects of revenue cycle management, and all billing information can be changed retroactively. The system allows for tracking of interim bills, collecting amounts on-line, and printing of statements. Claims are generated electronically, and all billing account information can be accessed from one central screen. Exhausted benefits tracking features calculate and update "days remaining" information for co-insurance and Lifetime Reserve days. Room and bed charges can be pre-billed for self-pay patients, and Medicaid patients can be pre-billed for liability amounts.
379.			4. Resident Trust Accounting	A Resident Trust Accounting feature allows for deposits, withdrawals, statements, and report generation. In addition, the Resident Trust feature integrates with the accounts receivable portion of the resident's account in order to track income and entitlements. Direct deposits to the trust fund can be automatically transferred to the client's account.
380.			5. Risk Management	MEDITECH's Risk Management software provides a vehicle for capturing client-specific risk factors such as incidents, behaviors, stress contributors, and supports, in order to monitor a client's level of risk. Non-client-related events are also supported and the system incorporates a follow-up review process in order to ensure appropriate notifications are performed. User-defined automatic alerts can be sent to the treatment team, case manager, and supervisory personnel on any critical items that require intervention. Alerts can be based on a single event or a series of events. Reports are provided to monitor any mandatory review policies and the system can provide electronic files for submission to outside agencies. Information is integrated with our Admissions application and Enterprise Medical Record.
381.			6. Legal Status and Tracking	MEDITECH's Legal software allows for quick and accurate collection and maintenance of guardianship, legal, and forensic (court commitments) information. Staff is able to track court-ordered data such as medications, treatments, restraining orders, and privileges, as well as notification information for guardianship, court contacts, and duty-to-protect contacts. The system also allows capture and maintenance of legal assignments including legal status, criminal charges, and guardianship type. Additionally, staff can monitor court appearance dates, reviews, and renewals. MEDITECH's Legal software is fully integrated with our Health Information Management, Risk Management, Care Management, and Enterprise Medical Record products to ensure appropriate individuals are aware of any restrictions or policies before they take action.